NOV. 27 1959

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

UNIV MICROFILMS INC
EDITORIAL DEPT
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Price 50 Cents

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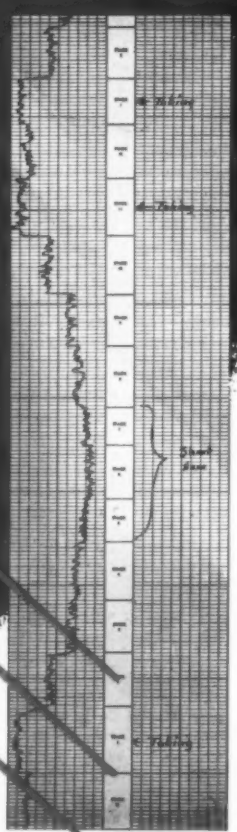

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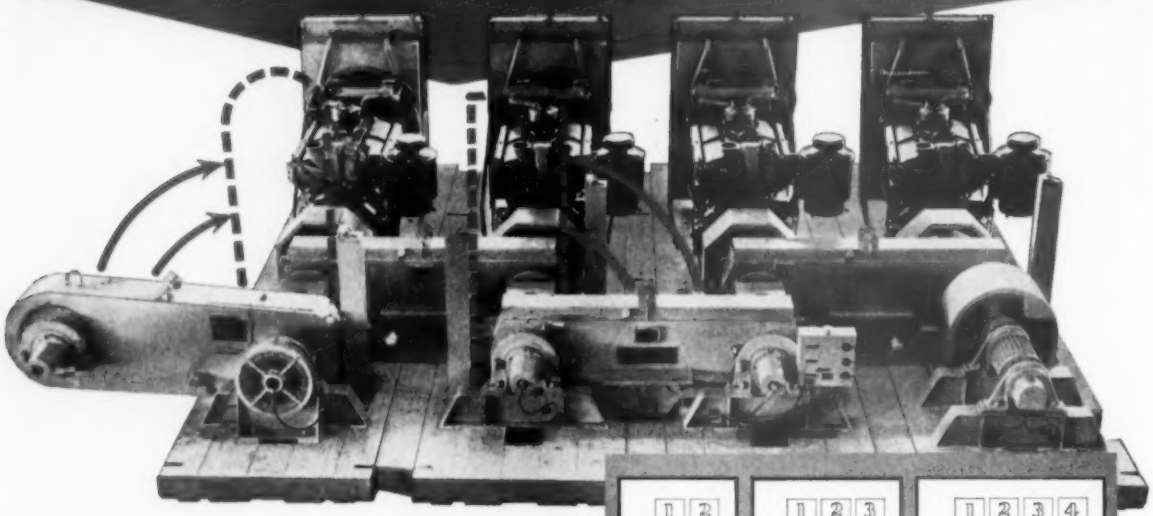

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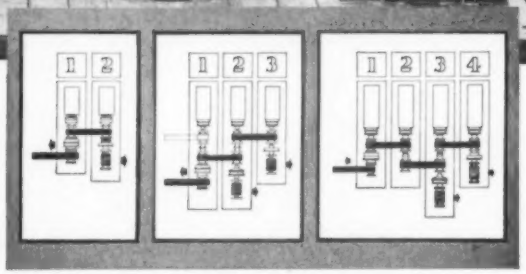

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INSIDE *Slant*

GOOD OLD DAYS

A couple of veterans of the area were recalling the good old days during the recent meeting of the Rocky Mountain Oil & Gas Assn., at Denver.

And good old days they were, when a producer could get his money out of a well in a few months instead of the five to ten years it now takes in some areas. Some don't get it back that soon now.

And it isn't because the wells don't have the producibility. It's simply a case of too much oil for the available market.

The two veterans, who prefer to remain anonymous, got quite a laugh over how, through shrewd negotiation, they were able to obtain a producing oil property for $1,175,000, which paid out in 18 months.

The unusual part of the transaction is that it was for a 34% interest in only an 80-acre lease.

That's quite a payout for such a small interest. Fortunately, though, the price of crude was increased shortly after the deal was made.

Then, too, deeper drilling also enhanced the value.

And the property still is producing.

LeRoy Menzing
Editor

Good Wells Make Good News

A Monthly Report On Wells That Are Now Worth More

November 27, 1959

This month, the jobs reported are more of those engineered by Dowell with the aid of the "Frac Guide"*. You will notice the excellent results.

- **Greenwood County, Kansas** (New Oil Well) This open hole completion was made into the Bartlesville sand from 1837 to 1862 feet. Production was only one bopd. Dowell engineers recommended Waterfrac on the basis of calculations made with the "Frac Guide". 5000 gallons gelled water with FLA* (Fluid Loss Additive) and 20,000 pounds sand were injected down casing at 27 bpm and 800 psi. Five days after treatment, well was flowing 100 bopd with only a show of water.

- **Brazoria County, Texas Gulf Coast** (Old Gas Well) Gas production had declined to only 417 mcfd. Pay was the shaly Frio sand from 6214 to 6224 feet. The "Frac Guide" indicated the use of Acid Petrofrac*. Dowell injected 5000 gallons acid-oil emulsion and 15,000 pounds 40-60 sand at 6 bpm and 4400 psi. Treatment was made through tree down 2½-inch tubing, allowing the operator to avoid using a workover rig. Production rose to 9000 mcfd — more than a twenty-fold increase.

- **Glasscock County, West Texas** (Old Oil Well) This Spraberry well had depleted both the lower Spraberry and the shallower Clearfork. The operator plugged off both these zones and re-completed into the upper Spraberry by perforating the casing from 6870 to 6905 feet. Then Dowell engineered a treatment with the "Frac Guide" using 10,000 gallons refined oil, a fluid loss control agent, 35 perforation ball sealers and 45,000 pounds sand. After treatment, which was down 3-inch tubing, the well potentialed 93 bopd.

- **Montague County, North Texas** (New Oil Well) This well swabbed only one boph after completion into the conglomerate through three sets of perforations between 5852 and 5928 feet. Dowell engineered a four-stage down-casing fracturing treatment that included 40,000 gallons gelled crude, 60 ball sealers, 2000 pounds of a fluid loss control agent and 94,800 pounds sand. Before the treatment, 500 gallons of Mud Acid was used to wash the formation and the well was swabbed. After treatment, well tested 432 bopd, flowing on ½-inch choke.

In area after area, Dowell continues to get improved results with the "Frac Guide". Take advantage of this experience to help you get the results you want. For service or detailed information, contact the Dowell office or station nearest you. There are more than 165 locations in the United States, Canada, Venezuela and Argentina. Dowell, Tulsa 1, Oklahoma. *Dowell Trademark

Services for the oil industry DOWELL
DIVISION OF THE DOW CHEMICAL COMPANY

60-Second Summary / WHAT'S HAPPENING IN OIL

November 27, 1959

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Stocks of at least ten leading companies are below "desired" levels, despite a nationwide surplus. That's the gist of reports of a dozen firms—holding 51.8% of U.S. stocks of crude and major products—to the Texas Railroad Commission. . . . p. 11

•

Ohio Oil is cutting its Robinson (Ill.) refinery costs by more than $100 a day. The secret: use of an electronic computer to optimize operation of a cat reforming unit. . . . p. 38

•

Better well spacing might be achieved by revising the proration formula. That's the recommendation of a special study committee, which urged that more weight be given to acreage. . . . p. 14

•

Most oil men consider Cuba's new petroleum law a first step to nationalization. It imposes controls on refining, exploration, and prices, and slaps a 60% royalty on production. . . . p. 13

•

The huge waterflood at California's Wilmington field is picking up speed. Eight rigs are now drilling injection wells—in addition to the six recent completions. . . . p. 19

•

Oversupply pressures are giving oil jobbers the willies. The outlook isn't bright, and jobbers are debating margin adjustments and contract revisions. . . . p. 42

•

Spain is now weighing a variety of oil company "added inducements" for concessions in the Sahara. The "extras" are included in detailed new bids opened in Madrid. . . . p. 36

•

Residual fuel oil imports quotas will be hiked substantially. The gain may be 100,000 b/d or more, even though a survey showed stocks well above previous reports. . . . p. 13

•

Resin-coated pipe will soon be available in a wide range of sizes. It's the latest advance in protecting line pipe against external corrosion. . . . p. 28

•

The text of the widely discussed joint Arab oil policy statement was made public last week. It calls for tightening of present and future concession terms. . . . p. 35

•

A drilling spurt in Oklahoma's Dewey County is bucking the trend in the Anadarko Basin. Activity has climbed from almost nothing to more than a dozen new tests this year. . . . p. 22

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

November 27, 1959

Additions to refinery crude charging capacity in the next year will be the smallest in years, reflecting the present high excess capacity. In the year ending next Sept. 30, the American Petroleum Institute estimates that only 62,000 b/d of new capacity will be added, compared with an increase of 126,550 b/d in the year ended last September. Estimated operable crude charging capacity by next September will total 9,782,150 b/d.

Of the increase expected, 40,400 b/d will be in the Midwest, 27,600 b/d in the Southwest, and 7,500 in the Rockies. Capacity on the West Coast will decline by 13,000 b/d, and on the East Coast by 500 b/d.

At the present operating rate of 8-million b/d, the U.S. has 1,720,000 b/d of excess capacity, including 522,850 b/d shut down and believed to be in the "high-cost, marginal group."

•

Continental Oil Co. has completed its first MGM test as a discovery at Culver City, Calif. Located on MGM Studio property, it tested at a rate of 720 b/d through a "restricted" choke at a depth of 8,807 ft. Continental said the producing interval is in a sand "different from and unrelated to" any producing sand in the nearby Inglewood field.

•

Texaco Inc., at midweek, complied with the Texas Railroad Commission's request for its inventory figures. The company previously had refused to give actual stock figures, and had turned in its report on a days' supply basis (page 11). Texaco filed these stock figures, as of Nov. 1: crude 20,840,000 bbl., 566,000 bbl. below the desired level; gasoline, 15,286,000 bbl., 384,000 bbl., below the desired level; distillates (including kerosine), 13,526,000 bbl., 70,000 bbl. below the desired level; and residual, 5,767,000 bbl., 248,000 bbl. below the desired level.

Tidewater Oil Co., which did not offer testimony at last week's hearing, also gave its inventory position. As of Nov. 1, principal stocks were: crude, 6,502,000 bbl., 298,000 above the desired level; gasoline, 4,432,000 bbl., low by 118,000; distillates, 6,942,000 bbl., 186,000 bbl. above desired; and residual, 1,015,000 bbl., high by 265,000 bbl.

•

The first step in ultimate consolidation of Jersey Standard's U.S. affiliates was taken at midweek. Humble Oil & Refining Co. shareholders overwhelmingly approved the merger with Jersey and the establishment of a new Humble Oil & Refining Co. (Del.). Jersey stockholders will vote Dec. 1.

The Justice Dept.'s annual antitrust report on the Interstate Oil Compact will be released soon—probably next week. No serious attack on Compact activities is expected.

•

U.S. buyers have upped their December nominations for Canadian crude. U.S. bids for Alberta crude for the Puget Sound and Midwest areas totaled 63,200 b/d, an increase of 16,700 b/d over November.

A $3 billion organization with 285 branches covering the oil provinces alone, Canada's First Bank is uniquely equipped to assist your Canadian oil or gas operation.

"A Guide for Oil & Gas Operators in Canada", 40-page handbook published by the B of M is yours for the asking. Write on your business letterhead to John A. Baines, Mgr., Oil & Gas Dept., 140 Eighth Ave. West, Calgary, Alta., Canada—or our nearest U. S. office.

NO STOCK RECOMMENDATIONS

While the Bank is prepared to provide all available information on the oil industry, it does not make recommendations regarding the purchase of individual oil stocks.

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275 BRANCHES IN CANADA, UNITED STATES, GREAT BRITAIN AND EUROPE
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DEPT/Opinions

Views That Make News . . .

"It should frighten you that the oil industry is losing its voice in the domestic and foreign policies that bear on its everyday life."

—J. Howard Edmondson
Governor of Oklahoma

"Petroleum possibilities on the moon, based on the volcanic hypothesis (or volcanic origin of craters on the moon's surface), are nil."

—Dr. Jack Greene
Aero-Space Laboratories
Missile Division
North American Aviation

"The opponents consistently exaggerate both oil income and depletion. In a copyrighted booklet, a senator starts his analysis of depletion with this sentence: 'Suppose the well produces $5-million of oil for each of ten years.' The reader is expected to infer that this may be a typical situation. But the average well in the U.S. produces about 14 b/d, and for 365 days at $3 a bbl. this is about $15,000 a year. The senator's example is 330 times the average. No U.S. wells are producing that much.

"What if he were debating the farm problem and gave an example of a cow with such exaggerated producing capacity? How scientific a farm program could we expect from such thinking?

"The distressing thing about it is that another senator wrote a forward to this booklet saying, 'The sound principles he there laid down furnish a foundation for public understanding.' "

—Lowell Stanley
Economist
Beverly Hills, Calif.

. . . and Letters

Dear Sir:

I must commend you for your editorial "Oil's Need for a Voice Is Urgent" [PW—Nov.6'59,p134]. You put your finger on a very serious need, and your use of the coal industry as an example was very apt.

The coal industry had so many different points of view over the years, they were not making the progress that they felt their problem justified. Already, since they have unified their thinking, they are moving forward; in fact, so much as to frighten some of the rest of us as to their possible effectiveness.

You well understood my point of view, in that my function was one of limited scope. Fortunately, my people, in the beginning, pretty well delineated the activities with which I should be concerned, and working with those guidelines has been much better than if I had been just turned loose to browse where I had the impulse.

Russell B. Brown
General Counsel
Independent Petroleum Assn. of America

Dear Sir:

The caption with your photograph "Huge Mobile Blender Joins Work Fleet" [PW—Oct.16'59,p29] has recently come to our attention. In the caption the phrase, "This giant sandfrac blender . . ." appears.

There seems to be some misunderstanding with respect to the use of the word "Sandfrac," which is a registered service mark of the Dowell Division of Dow Chemical Co. We would like to clear up this misunderstanding in the interest of protecting our service mark.

"Sandfrac" is a Dowell registered service mark (Registration No. 584015) and identifies "well treating services—namely, hydraulic fracturing of underground earth formations and propping open the resulting fractures." No one other than Dowell can use "Sandfrac" without our consent unless they infringe the service mark. Of course, we are willing to give consent in all reasonable cases, but we ask those who use the mark to do so only under conditions which preserve our rights.

C. L. Lunsford
Patent Agent
Dowell Division,
Dow Chemical Co.

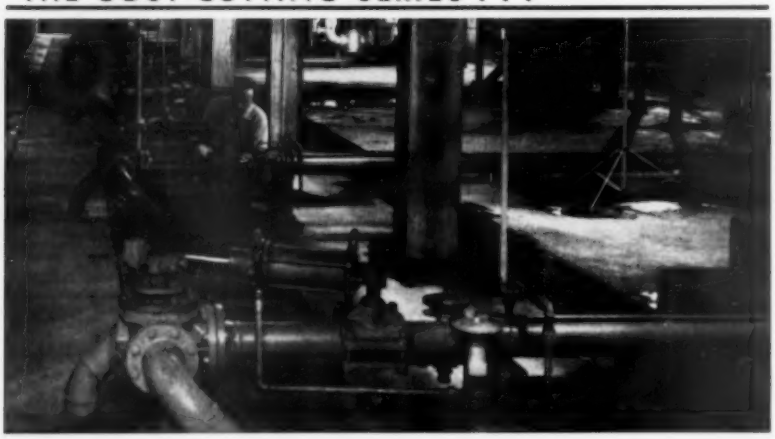
Dear Sir:

Just a short note to tell you I appreciate your running the little story about my speech to the Desk & Derrickers, "They Said It Couldn't Be Done," in your Inside Slant [PW—Oct.16'59,p3].

Michel T. Halbouty
Independent producer
Houston

Petroleum Week will publish reader comments each week. Address letters to LeRoy Menzing, Editor, Petroleum Week, 330 W. 42nd St., New York 36, N. Y.

THE COST CUTTING SERIES . . .



3-WAY VALVE solves unique problem

At a large refinery, three-way lubricated plug valves helped solve a unique problem in routing of product from process units. Actuated by a thermostatically controlled air cylinder operator, the Rockwell-Nordstrom Multiport valves route hot waste into one line and then automatically switch as waste temperature drops and discharge cold waste into another line. The Multiport valves greatly simplify this kind of installation because three and even four lines can be controlled with *one* valve. With a variety of plug and opening arrangements, these valves have proved ideal for blending, batching, pressure relief, and process manifolding. For complete details on Rockwell-Nordstrom Multiports (and a complete line of Straightway valves) write: Rockwell Manufacturing Company, Pittsburgh 8, Pa.

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

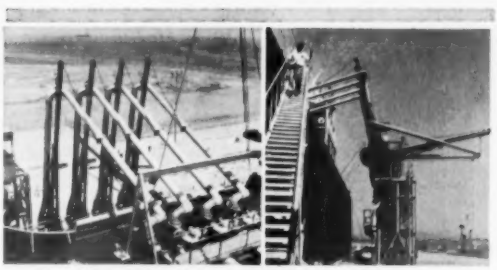
THIS CHIKSAN MARINE LOADING SYSTEM INCREASES FLOW CAPACITY, REDUCES OPERATING COSTS FOR UNION OIL

What you see in the photo above is a Chiksan Marine Loading System on a new multi-million dollar supertanker terminal at Los Angeles operated by Union Oil Company of California. Designed to speed unloading operations, this Chiksan System has five 12 inch by 52 foot arms, three normally in crude oil and two in bunker oil service.

Each arm is capable of handling 15,000 B/H of refined product and up two 11,000 B/H of crude; a greater capacity than any method previously used by Union Oil.

Translated into faster turn around time, this increased flow capacity coupled with other savings through such factors as improved safety conditions results in significantly lower operating costs for Union Oil.

Plan now to install the Chiksan Marine Loading System at your terminal. For full information and recommendations, contact Chiksan.



100-105 PSI ACROSS THE RAIL is safely handled by the Chiksan all metal arm. In addition, smooth interior diameter reduces turbulence permitting more efficient pumping flow.

CLEAN, COMPACT DESIGN has permitted substantial construction savings in some cases through use of smaller docks to house equipment, and outboard dolphins to handle mooring lines.

#59-47

CHIKSAN fmc

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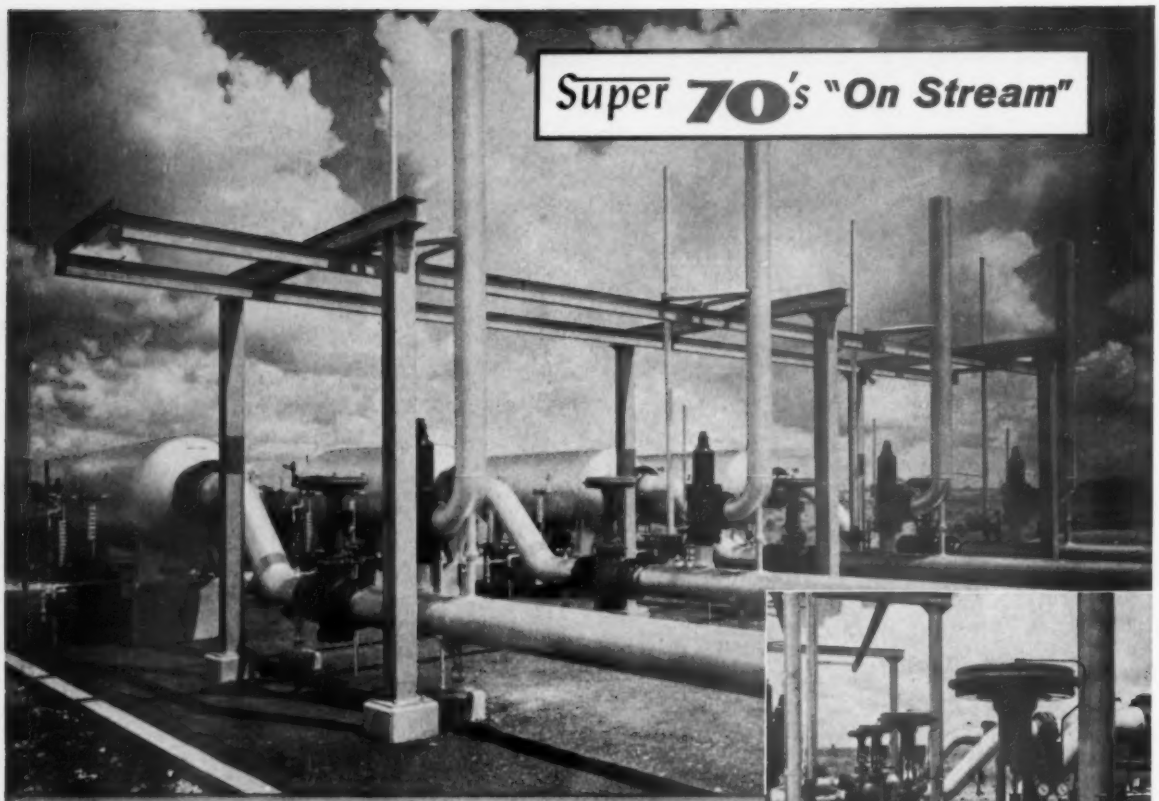


"Life-Blood" of a Large Refinery!

BS&B Super 70 Diaphragm Control Valves with Clamp Ring—Float Ring Body Closure.

This natural gas metering station feeds 100 MMSCF of gas per day to a large Gulf Coast Refinery. If it were necessary to shut down the station for repairs, operation of the refinery would be seriously impaired.

That's why engineers who designed the station wanted to be absolutely sure the control valves would function properly day in and day out under all operating conditions.

Because of their superior performance characteristics and rugged dependability . . . and because of BS&B's reputation for quality products and dependable service in the oil industry . . . BS&B Super 70 Control Valves were selected. Now "on stream", they are performing well in every respect.

BS&B Super 70 Valves are available in a complete range of sizes . . . with either clamp ring—float ring, or flanged—gasketed body closures. Specify them on your next job!

BLACK, SIVALLS & BRYSON, INC.

Controls Division,
Dept. 4-EU11
7500 East 12th Street
Kansas City 26, Missouri

SUPER BS&B 70

Last week 12 companies said that their INDIVIDUAL stocks on Nov. 1 were below desired levels. The totals of their inventory positions were:

Last March, 23 companies estimated the desired Nov. 1 TOTAL U.S. stocks. Here's how the average of those estimates compares with actual Nov. 1 stocks:

(In millions of barrels)

	Stocks on hand	Desired Level	Difference	Desired Nov. 1 Position	Actual Nov. 1 Position	Difference
Crude	137.8	137.9	—0.1	257.7	256.0	— 1.7
Gasoline	87.5	88.1	—0.6	154.0	176.4	+22.4
Distillates (inc. kerosine)	117.6	119.3	—1.7	190.7	214.5	+23.8
Residual	22.0	23.1	—1.1	48.9	58.0	+ 9.1
Total	364.9	368.4	—3.5	651.3	704.9	+53.6

Major Buyers Say: 'Stocks Are Low'

Companies which hold 51.8% of the total primary stocks of crude and major products say their inventories are generally below the "desired" levels for this time of year.

That's the summation (above) of individual inventory figures supplied to the Texas Railroad Commission last week. The data supplied by 12 companies reflect individual stock positions as of Nov. 1 compared with the individual "desired" position for that date (table, page 12).

One other company—Texaco Inc. —did not provide its stock data in barrels as requested by the commission, but instead translated its figures into day's supply on hand and day's supply desired.

The total of the 12 companies' individual inventory positions showed stocks of 3.5-million bbl. below desired levels. In sharp contrast, total U.S. stocks of crude and major products are 53.6-million bbl. in excess of desired levels.

This nation wide surplus position is based on the testimony of 23 companies—including ten of the 13 that testified last week—given to the commission last March.

At that time, the companies estimated the desired levels of total U.S. stocks of crude, gasoline, distillates, and residual for Nov. 1. The average of the estimates placed the desired inventories of crude and the principal products on Nov. 1 at 651.3-million bbl.

The actual position on Nov. 1, based on American Petroleum Institute data on refined products and Bureau of Mines figures for crude, totaled 704.9-million bbl., 53.6-million above desired.

The main reason the commission sought the individual inventory data was to determine if the leading buyers of Texas crude held surplus stocks, in view of the excess position in the nation.

The 12 companies' total crude inventory was the only stock category that appears in line with the total U.S. stock position.

The summation of the 12 companies' positions showed that their crude stocks were 101,200 bbl. below desirable, compared with a nationwide crude inventory 1.7-million bbl. below desired.

But in all other inventory categories, the 12-company total (as well as the day's supply position of Texaco) showed a deficit inventory position. Nationwide, all categories of product inventories on Nov. 1 were well above what 23 companies had estimated as desirable.

Only three companies — Mobil, Shell, and Sun — reported an overall excess position on stocks.

Mobil testified that, while its crude stocks were 212,000 bbl. below its desired level, its gasoline, distillates (including kerosine), and residual were in surplus on Nov. 1, giving the company an over-all surplus of 768,000 bbl., in crude and the major products.

Shell's surplus position was by far the largest—amounting to 2.5-million bbl., or 4.9% of its stocks of 51-million bbl.

Shell's crude inventory position on Nov. 1 was the longest, 1.6-million bbl. above the company's desired level. Its gasoline supply was in excess of desired by 700,000 bbl., distillates were long by 400,000 bbl., but its residual fuel position was 200,000 bbl. below the desired level.

Sun reported a surplus only in residual fuel—amounting to 220,000 bbl. —while other inventories were "in balance."

Standard Oil Co. (Ind.) reported the tightest inventory position, with its over-all supply 3,640,000 bbl. less than desired.

The company, which has been refining less crude than normal due to a series of refinery strikes over a large part of 1959, reported a crude surplus of 875,000 bbl. and a product shortage of 4,515,000 bbl., 50% of which was distillates.

Indiana's Nov. 1 crude stocks totaled 31,875,000 bbl., or 12.4% of the nation's total.

Indiana Standard and Phillips Petroleum were the only companies reporting any significant shortage of distillates.

Indiana said it was 2,270,000 bbl. below desired on distillates, and

Individual Stock Positions Given Texas Railroad Commission

(In thousands of barrels)

	CRUDE			GASOLINE			DISTILLATES (inc. kerosine)			RESIDUAL		
Company	Nov. 1 Actual Stocks	Nov. 1 Desired Stocks	Difference	Nov. 1 Actual Stocks	Nov. 1 Desired Stocks	Difference	Nov. 1 Actual Stocks	Nov. 1 Desired Stocks	Difference	Nov. 1 Actual Stocks	Nov. 1 Desired Stocks	Difference
Atlantic	8,209	8,300	— 91	3,099	3,075	+ 24	8,846	8,790	+ 56	1,148	1,164	— 16
Mobil	17,529	17,741	— 212	10,667	10,433	+ 234	20,948	20,444	+ 504	2,733	2,491	+ 242
Indiana	31,875	31,000	+ 875	15,820	17,600	—1,780	14,330	16,600	—2,270	2,235	2,700	— 465
Sinclair	14,800	15,000	— 200	7,534	7,500	+ 34	11,065	11,250	— 185	3,388	3,200	+ 188
Shell	17,500	15,900	+1,600	14,600	13,900	+ 700	15,900	15,500	+ 400	3,000	3,200	— 200
Sun	7,483	7,483	.....	4,479	4,479	.....	3,795	3,795	.....	1,064	844	+ 220
Humble	14,000	14,500	— 500	3,300	3,500	— 200	3,600	3,700	— 100	1,000	1,000	.....
Gulf	12,600	13,500	— 900	12,500	12,300	+ 200	19,700	18,400	+1,300	5,800	7,000	—1,200
Standard of Texas	768	1,000	— 232	529	575	— 46	290	306	— 16	139	116	+ 23
Phillips	4,042	4,200	— 158	7,789	7,500	+ 289	7,850	9,000	—1,150	168	100	+ 68
Cosden	415	500	— 85	860	1,000	— 140	192	192	.....	483	483	.....
Cities Service	8,522	8,500-9,000	.....	6,323	6,000-6,500	.....	11,103	11,100-11,500	.....	821	800-850	.....
Texaco*	7 days	8 days	—1 day	10 days	11 days	—1 day	41 days	41 days	.....	10 days	11 days	—1 day

*Texaco did not give data in barrels at last Friday's hearing.

Phillips testified that its distillates supply totaled 1,150,000 bbl. below desired.

Gulf Oil, on the other hand, reported that its distillates stocks were 1.3-million bbl. above desired; Mobil's supply was 504,000 above desired; and Shell reported an excess of 400,000 bbl.

The over-all "deficit" levels of gasoline and distillates inventories reported by the 12 companies were surprising to many observers, in view of the price weakness that has plagued the products markets.

Gasoline, which has been subject to discounts in the primary markets and price "wars" in many local markets all year, continues to be available in the Gulf Coast markets at from ¼¢ to ½¢ a gal. off the spot market "lows."

No. 2 heating oil—the major distillate material—has been at a five-year low of 8⅛¢ a gal. in the Gulf Coast spot market since last summer.

And only last week, one distress cargo of heating oil left the Gulf "without a home." An eastern buyer was found while the cargo was en-route, but the price reported brought a Gulf netback after transportation charge of between 7.1¢ and 7.2¢ a gal.

In view of the anticipated seasonal upturn in demand, the Railroad Commission adhered to the requests of a majority of the Texas crude purchasers and hiked the initial December allowable by 121,192 b/d to 2,904,625 b/d.

The commission set the December producing schedule at ten days, the first increase in the producing-day schedule since June. Nine days were set for each of the five months from July through November.

The ten-day schedule for December means that for all of 1959, Texas will have 123 producing days, one more than in 1958.

The ten-day schedule was favored by Atlantic, Mobil, Sinclair, Sun, Texaco, Standard of Texas, Phillips, and Cosden.

Humble, which had reported its crude stocks 500,000 bbl. below its desired level on Nov. 1, requested an 11-day pattern. The company said it had arranged for spot crude purchases of 76,000 b/d next month, and that it would need "considerably" more.

Four companies—Indiana, Shell, Gulf, and Cities Service—plus an independent producer spokesman recommended a continuation of the nine-day producing schedule in December.

Jake L. Hamon, of Dallas, speaking for one group of independents, urged the commission to continue the nine-day pattern to eliminate the surplus inventory position. Consumption, he said is below expectations, and the steel labor situation has put a damper on the outlook.

Also last week, the Kansas Corporation Commission hiked the Kansas allowable for December by 5,000 b/d.

The new allowable is 325,000 b/d, a figure recommended by Conservation Director Jewell Ogden.

Outlook Brightens in Arkansas

Arkansas' oil industry is shaking itself out of the exploration doldrums that accompanied the long strike at American Oil Co.'s El Dorado refinery. An agreement ended the 134-day walkout two weeks ago (PW—Nov.13'59,p14). And local oil men feel that the settlement will give exploration activities a much-needed shot in the arm.

A spokesman for the Arkansas Oil & Gas Commission says exploration activities are down "at least 80% from last year."

One result, according to the commission, is that new field discoveries are off 80% to 85% from 1958.

The exploration slump set in immediately after the strike started. The Amoco refinery provides an outlet for 44% of the state's oil.

The strike forced the commission to increase its per-barrel assessment rate by 1½ mills. It now stands at 4 mills per bbl.

The assessment is collected on every barrel of oil produced, saved, or sold from wells brought in since Jan. 1, 1937.

But at that, the increase is much less than had been discussed publicly. Two weeks ago, the commission was thinking in terms of a 5-mill boost (PW—Nov.13'59,p49).

Higher Residual Quotas Are Coming

It now appears certain that import allocations for residual fuel oil will be increased despite the findings of a survey showing residual inventories considerably above what had been believed.

Indications are that the new allocations, covering the first half of 1960, will be announced by early December. In addition to higher residual quotas, a general increase is anticipated for crude and light products, though in the latter categories the hike is expected to be small.

The increase in residual allocations will amount to at least 100,000 b/d for the areas east of the Rockies, and maybe much more.

And while many observers say that an increase could be needed to meet peak winter demand, some are afraid that, once it's approved, the higher allocation could cause a glut of resid in storage by spring.

In the case of resid, the Interior Dept. can vary the actual monthly imports within the maximum allocation. But so far, Secretary Fred Seaton and Imports Administrator Matthew V. Carson, Jr., have not used that authority.

In addition to the higher-than-expected residual supply in inventory, importers have not brought in their full allocations in the last half of 1959, regardless of their pleas for higher quotas.

The allocation for the areas east of the Rockies (Districts I-IV) for the July-December period average 360,000 b/d, or a total of 66,973,512 bbl. for the period. Through October, only 30,591,551 bbl. had been imported—excluding bonded fuel.

The resid inventory survey by the Oil Import Administration showed East and Gulf Coast stocks on Oct. 31 to be 32.3-million bbl., compared to about 19-million bbl. expected to be reported by the Bureau of Mines, another Interior agency.

The breakdown of the survey by Carson's office showed resid stocks in primary and secondary storage on the East Coast on Oct. 31—excluding bonded and military stocks—at 24.7-million bbl., about the same as on Sept. 30.

The Bureau of Mines' Sept. 30 figure placed East Coast supplies at only 12.8-million bbl. The bureau has not tabulated Oct. 31 stocks yet, but indications are that its figure will be in the same range as the September inventory position.

The difference between the Carson office figure for Oct. 31 Gulf Coast stocks of 7.6-million bbl. and the Bureau of Mines' expected figure may be only 1-million bbl.

The "discrepancy" in the inventory figures arises chiefly because the Bureau of Mines data do not include "secondary" stocks—or inventories held by distributors.

The Oil Import Administration data included inventories of about 100 distributors, plus data from a few large primary suppliers—refiners and pipeline companies—that do not report to the bureau.

New over-all import allocations for crude and products will follow a White House proclamation revising several aspects of the mandatory import program.

Awaiting President Eisenhower's signature this week was a proclamation drafted by Interior officials which would:

- Consider presently exempted Canadian crude imports on the West Coast as part of domestic supply.
- Give consideration to newcomers to import resid and other products on a case-by-case basis with the allocation to come from a "kitty" to be set up for the purpose.
- Allow the Oil Import Appeals Board more leeway in granting larger allocations to appellants.

Cuban Step to Nationalization?

Cuba's projected new petroleum law adds up to this: controls on refining, exploration, and prices, and a 60% royalty on crude production.

The measure, passed last week by the Council of Ministers, will not become law until published in the Official Gazette. But it is regarded in many circles as a step toward possible nationalization of the industry in the future.

It created the Cuban Petroleum Institute, and delegated to it the responsibility for supervising and administering all phases of the country's oil operations.

These include:

- Exploration, production, refining, transport, purchase, and sale of petroleum and its derivatives.
- Development of the petrochemical industry or allied types of commercial or manufacturing operations.
- Administration of all "intervened" companies which are dedicated to any phase of petroleum operations.

It also specified that the Agriculture Ministry, through its Mines & Petroleum Dept., can establish operational quotas for all refineries.

There was no immediate indication of what these quotas might eventually be. But the move left no doubt in the minds of observers as to the government's intent.

There are three foreign-owned refineries in Cuba, involving an investment of roughly $75-million and 82,000 b/d of capacity.

Shell has a 27,000 b/d plant at Havana that cost $20-million; Esso has a 35,000 b/d refinery at Belot in which it has invested $35-million; and Texaco has a $20-million, 20,000 b/d operation at Santiago.

The levy on production is entirely in the form of a royalty—a discouraging blow to present operators and a deterrent to potential newcomers.

Current Cuban output averages between 500 b/d and 600 b/d, a volume which would not encourage producers to remain in view of the new law.

The government mitigated this slightly, however, by ruling that the royalty would be reduced to 55% on all Cuban crude that is processed in Cuba for export.

The reason behind this is that Cuba wants to build up its export market, if possible, to obtain urgently needed dollars and credits.

Cuba's domestic demand currently runs around 50,000 b/d. Most of the crude that's processed in the refineries comes from Venezuela.

American oil men feel the new law will hurt exploration and production in the island.

It stringently limits exploration concessions to a maximum of 20,000 acres, and establishes mandatory drilling programs.

The dimensions of the drilling programs are graduated with the acreage, but the bedrock minimum is one hole per year, to a depth of at least 2,000 ft.

A discovery automatically converts an explorer to a developer, and doubles the footage he must drill annually.

Big companies have spent an estimated $30-million in the last dozen years in exploration activities in Cuba. Their claims on millions of acres are now nullified by the new law's 20,000-acre limitations.

Spacing report suggests:

Revise Texas Proration Formula

A special study committee feels that optimum well spacing in Texas might be achieved by giving more weight to the acreage factor in proration formulas.

The idea was advanced last week at the annual meeting of the West Central Texas Oil & Gas Assn., in Abilene. It, as well as other recommendations in the report, were adopted immediately by the group.

Directors of the association thought so much of the report that they voted to send it to other groups for their information and guidance.

The study committee, headed by James E. Russell, contended that present allocation formulas permit a disproportionate amount of production from tracts smaller in acreage than standard proration units.

This results in "confiscation of property just as surely as though the operator had been denied the opportunity to recover any of the reserves," the report said.

Such inequities could be corrected, it went on, by "giving more weight to the acreage factor than the well factor in the allocation formulas."

Although it wasn't spelled out in so many words, the inference was that the proposed change would have a tendency to promote better spacing patterns.

Forced unitization of such small tracts is not the answer, the committee said. But it did suggest that voluntary unitization would make it possible for the owners to recover their share of the reserves without unnecessary drilling.

For the present, the committee recommended against any change in the state's minimum spacing rule, or in Rule 37, which provides for spacing exceptions.

The committee expressed belief that proper spacing can best be achieved by applying sound engineering principles to determination of optimum spacing.

Tied in with this would be the sharing of mutual responsibility by the operators in obtaining data.

It was also felt that temporary spacing rules should follow in the wake of a discovery, before offset drilling could be begun.

Well spacing itself, however, will not solve the problems of overproduction, high costs, and conservation.

The committee said the essentials for proper spacing are geometry, stratigraphic configurations, depletion within reasonable time limitations, and economic considerations.

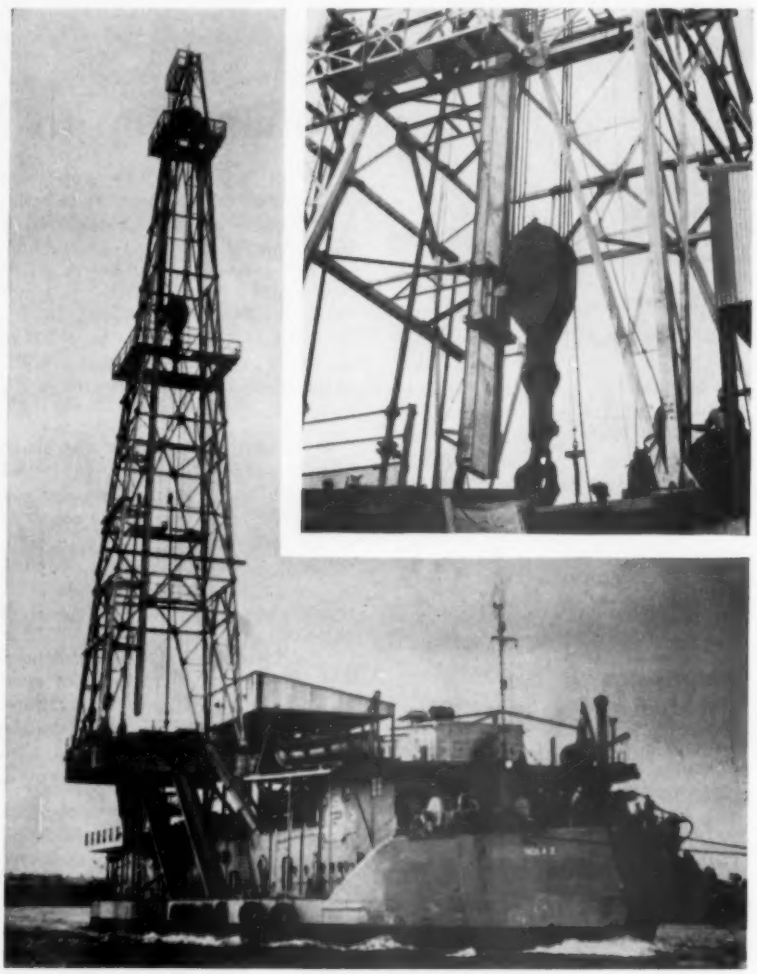
Among other things, the committee also reported that:

- Operators should be able to control well spacing to proper density without undue regulatory action.
- Each pool should be a separate case when considering best spacing and allocation of production.
- Close spacing does not result in any less recovery, but may result in unnecessary drilling expenditures.
- No statewide minimum spacing rule would fit all pools.

Concurrent with the study report was a plea for continuous vigilance against imports of crude and products.

This came from retiring president James S. Lauderdale, who charged that imports had reached "fantastic" levels at one point earlier this year, and had contributed heavily to the industry's oversupply problem.

Elected to succeed him as association president was Sam L. Robertson, of Robertson Oil Co., Abilene.



Traveling Block Runs on Track

A derrick specifically designed for drilling from a floating vessel employs a vertical track and roller device which prevents the traveling block from swinging (inset). The mast, designed by Lee C. Moore Corp. in conjunction with Zapata Off-Shore Co., has the same general dimensions as a standard size conventional derrick. It differs in construction in that it is composed of 16 welded sections with pin connections, rather than having all individual members bolted together. It is designed to withstand wind velocities of 100 mph.

What's New / IN THE INDUSTRY

Natural Gas Pipeline Co. of America wants to expand its system by 100-million cf/d to 830-million cf/d. The expansion plans, filed with the Federal Power Commission this week, would substantially increase gas supplies in the Chicago area. The $31-million program includes looping 151 mi. of Natural's main line with 36-in. pipe from near Mineola, Kan., to Joliet, Ill., and the laying of 180 mi. of 24-in. line from Mountain View, Okla., to Mineola. No compressor stations are involved.

Natural says the additional capacity will take care of newly discovered gas reserves and the upgrading of current reserves from Jack and Wise Counties, Tex., and various fields in Oklahoma. The company says the Mountain View-to-Mineola addition will "open up territory not too well served" by pipeline markets—an area which is believed to contain a sizeable amount of gas potential.

•

An eastern marketers group is making an extraordinary effort to promote public understanding of percentage depletion. The Empire State Petroleum Assn. is distributing 20,000 copies of a new book, "The Oil Depletion Issue," to opinion leaders, colleges, and public libraries. The book, just published by the Petroleum Industry Research Foundation, was written by two petroleum economists, J. H. Lichtblau and D. P. Spriggs. It is a comprehensive study of all aspects of percentage depletion. And it emphasizes that the tax provision is essential for the maintenance of existing price levels for gasoline and other oil products. In a foreword, an ESPA spokesman says the association's independent membership has no personal stake in percentage depletion but it feels the facts should be explored and explained to the consuming public.

•

Major international oil firms last week lost out in a Libyan land bid to an Italian company believed to be controlled by Italy's ENI. Cia. Richerche Idrocarburi (Cori) was granted 11,582 sq. mi. in eastern Libya, about 100 mi. east of the nearest oil find, Mobil's No. 1 Amal. The area was heavily overlapped with bids by Shell, Gulf, Mobil, Pan American, and Hunt International—all of whom were declared ineligible.

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Pure Oil Co.'s significant No. 1 Northwest Lisbon, in Utah's Paradox Basin, now has found a total of 839 ft. of pay in the Mississippian and Devonian formations (PW—Nov.20'59,p28). On latest test, at 8,261-361 ft. in the McCracken (Devonian), 7,500 ft. of 44.6-gravity oil and 500 ft. of heavily oil- and gas-cut mud were recovered. The company is now coring below 8,361 ft. in the Cambrian. There is no Devonian production in the basin, and nearest Mississippian is at Big Flat, 36 mi. northwest.

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George E. Conner has been elected president of Milwhite Mud Sales Co. He has been associated with the company since 1954. He became sales manager in 1955 and was elected executive vice-president on Jan. 1, 1958.

•

Dr. Guillermo Rodriguez, economics advisor to the president of Creole Petroleum, has been named to Venezuela's National Energy Council. The 18-member council, headed by Oil Minister Juan Perez Alfonzo, is an official policy advisory body, which will study and make recommendations on organization and objectives of the proposed Venezuelan oil company. The council also includes representatives of banking, business, and labor organizations.

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
November 27, 1959

The Federal Power Commission will seek U.S. Supreme Court review of the Transcontinental-Consolidated Edison case (PW—Nov.13'59,p22). The Justice Dept.'s Solicitor General will be asked to appeal the case because the commission is fearful that the lower court decision—if allowed to stand—will limit its powers on end use of natural gas. FPC had denied Transcontinental permission to transport to New York gas purchased in Texas by Con Ed. The U.S. Third Circuit Court of Appeals in Philadelphia upset the denial, holding that Con Ed's planned use of the gas—to fire boilers—was not necessarily "inferior use." If the Con Ed arrangement is upheld, more utilities are expected to buy their own gas in the field, then pay for transportation.

•

FPC has obtained a 30-day stay on the court order to approve a certificate for Transcontinental. The circuit court not only set aside FPC's denial, but ordered the commission to issue the certificate, subject only to further hearings on a minor rate issue. But the commission received a month's delay from the court—which gives sufficient time to appeal the case to the Supreme Court.

Coal interests will support FPC's position in the dispute. The Fuels Research Council, Inc., the coal industry's legal arm in regulatory matters, has served notice it will appeal the Transcontinental-Con Ed case regardless of the FPC decision to appeal. Coal companies recognize that court approval of boiler use of gas is a resounding blow to coal's market competition with natural gas.

•

The Roosevelt subcommittee will look closely at "coercion" of dealers next month. The House Small Business subcommittee headed by Rep. James Roosevelt (D., Calif.) will hold hearings Dec. 9-11 in the wake of a Federal Trade Commission examiner's finding that three oil companies "coerced" their dealers to sell certain lines of tires, batteries, and accessories. The five-man subcommittee is expected to concentrate on dealer testimony of threats allegedly made by supplier companies.

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The Justice Dept. is weighing its chances of winning an antitrust case against El Paso Natural Gas Co. A Federal Power Commission examiner's decision approving the El Paso-Pacific Northwest Pipeline Corp. merger may have tilted the scales in the company's favor. Examiner Daniel J. Kelly said a 1950 amendment to the Clayton Antitrust Act grants immunity from government prosecution to such mergers approved by FPC. Should the full commission back Kelly, lawyers think the Justice Dept. might be hard-pressed to continue its court case. El Paso already owns 99.8% of Pacific Northwest's common stock.

•

Oil men are angered at the prospect of using motor fuel taxes to build higher bridges along the Interstate Highway network. The highway program's trust fund—supported mainly by gasoline taxes—could be tapped for an extra $1-billion if the Commerce Dept. supports a military request for higher bridges. The Pentagon says present bridge plans give insufficient clearance to missile-bearing vehicles.

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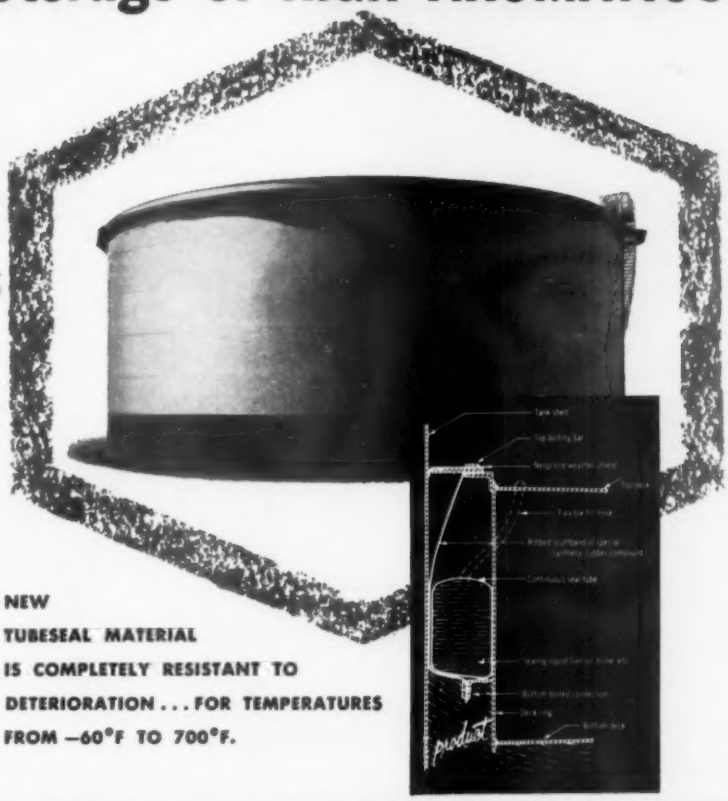

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- TOLUENE
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Wilmington Flood Is Getting Bigger

The busiest oil field in California, from the standpoint of drilling activity, is Wilmington field, where eight rigs are drilling injection wells to bolster what is rapidly becoming the world's biggest waterflood.

Of the eight rigs in operation, four are working for the City of Long Beach, one for Long Beach Oil Development Co., and three for Richfield Oil Corp. (L.A.).

Six injection wells have recently been completed, bringing the total to 92. Cost of each injection well ranges up to $100,000.

The huge flood has the double purpose of secondary recovery and of halting subsidence in the field area.

The immediate objective is to halt the land sinkage, especially in the critical area around the U.S. Naval Ship Yard, where subsidence has been the greatest—26 ft. at Edison steam plant at the corner of the yard (drawing, above).

Sinkage in the 20-sq. mi. subsidence area ranges from 2 ft. to 26 ft. A drop of from 3 ft. to 5 ft. has been recorded in downtown Long Beach.

The same installations used in halting the subsidence can be used for secondary recovery purposes thoughout the seven pay zones in the field.

There presently are eight water injection plants—handling a total of 328,929 b/d. Ten are planned.

Two of the eight were finished last month (PW—Nov.6'59,p25).

The injection rate is expected to be boosted to around 435,000 b/d through some 120 wells by the end of the year.

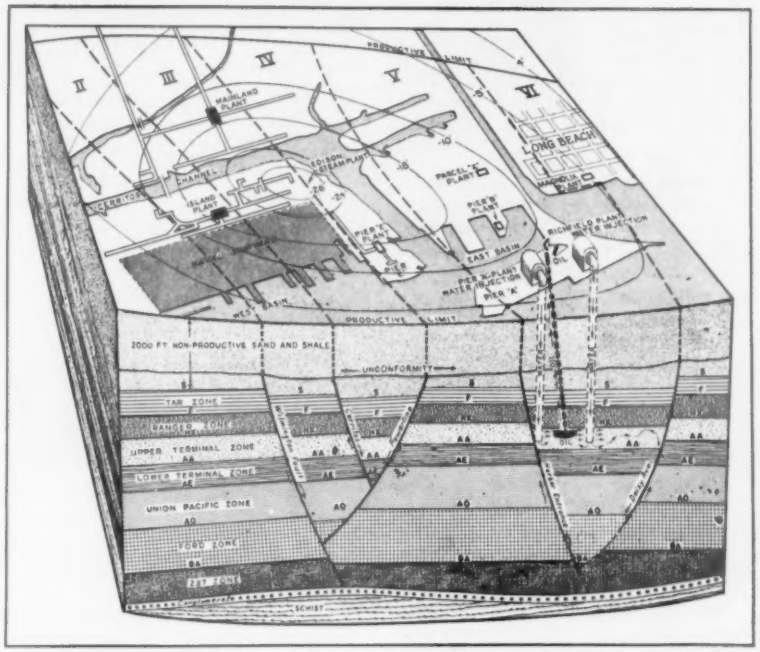
Ultimate goal of the flood is to inject 1-million b/d through 268 wells.

A harbor official says the already-lessening sinkage under the Naval installations can be halted in about six months, even though the over-all subsidence-control program is projected on a five-year basis.

"Substantial evidence of this," says Harry Ridings, Jr., president of the Long Beach Harbor Commission, "comes from our experience with the repressuring being done in the vicinity of Pier A, east of the shipyard.

"The sinkage around Pier A has been decreasing much beyond the normal trend. Also, the area favorably affected has been steadily widening, until it now extends to the downtown part of the city.

"Subsidence seems to have been arrested in about 700 acres, and its rate reduced in an additional 1,100 acres."



DRAWING of Wilmington field shows subsidence (contour lines) and fault blocks.

City officials are hopeful that the subsidence fight will help keep the Naval Shipyard in Long Beach. A Defense Dept. decision on this is due some time next month.

If the decision is made to keep the shipyard in operation, the Defense Dept. will have to ask Congress for an appropriation of more than $1-million for immediate safeguards and repairs for the installation.

The importance of the shipyard, and the Navy, to Long Beach are reflected in figures which show that 27.8% of the city's industrial economy is made up by fleet payroll, 8.8% by the Naval Shipyard, and 13.4% by harbor industries.

The remainder comes from tourists and conventions (4.7%), and from aircraft and other industries (45.3%).

At present, there seems to be little chance that the government will revive its efforts to halt production in the field, although damages probably will be sought.

The government's request for a preliminary injunction to halt production was taken off the court calendar last March, and there has been no effort to put it back.

"The government has no desire to shut the field down," says William P. Gray, Los Angeles attorney serving as a special assistant to the U.S. Attorney General in this case. "We feel we are on the way to stopping subsidence."

But, says Gray, "one of these days we are going to have to go to issue to see if the government is entitled to damages. Some day there will have to be a day of reckoning."

U.S. Rep. Craig Housmer (R., Calif.) counters Gray's opinion with a statement that he doesn't think damages are "an inevitable situation at all."

How long the cooperative injection can continue without a unitization agreement is a key question so far unanswered.

Present injection in Fault Blocks II and III is being conducted under cooperative agreements. Committees are working on details, made more difficult because of the complex faulting in the field.

One of the waterflood complications is the driving of oil from one area into adjoining ones, often across the boundaries of different owners.

It is estimated there are some 25,000 royalty interest owners in Wilmington field, which, in the early

days, experienced quite a bit of town-lot activity.

How long will the injection program last? A city spokesman estimates between 20 and 40 years, for oil recovery.

After the oil is recovered, it probably will be necessary to keep injecting water for a few more years to maintain pressures until they equalize.

Once this occurs, injection can be stopped.

Wilmington field has yielded about 830-million bbl. of oil since its discovery in 1936. An estimated 200-million bbl. of "primary" reserves remain, with an estimated additional 430-million bbl. recoverable through waterflooding.

The 6,800-acre field has seven roughly horizontal zones of oil sands, separated by shelves of almost impermeable shale.

These have been broken up by five principal vertical planes of slippage, or faults, in which the shale layers on one side become barriers against the oil sands on the other.

Thus, 42 main pools have been formed, along with many lesser pools.

The injection plants have the function of taking the formation salt water from source wells and distributing it to injection wells.

The water is injected at pressures ranging from 850 psi. to 1,250 psi. Pressures are controlled automatically.

Source wells average around 200 ft. in depth. The natural filtration of the formation salt water by the earth, and its low oxygen content, makes its use preferable to that of untreated sea water.

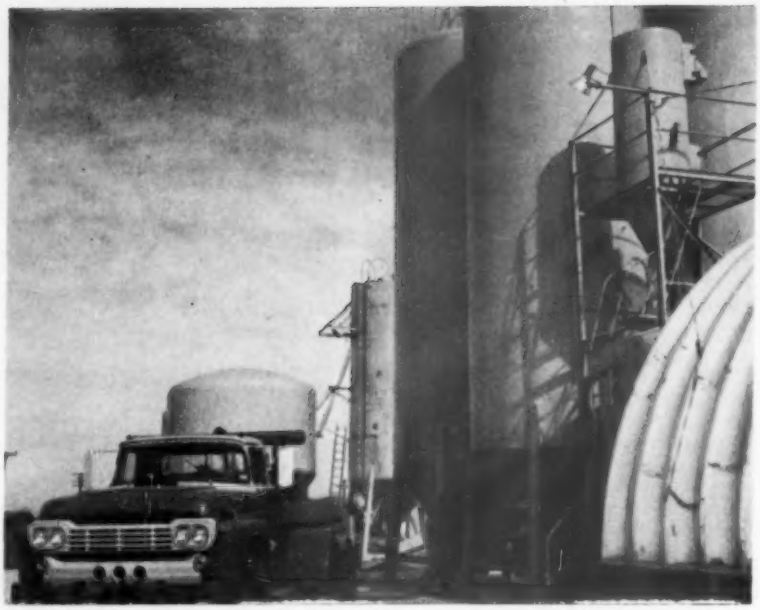
Source well pumps are stainless steel, deep-well, submersible, turbine types, which discharge through pressure-control valves to desanders.

The pressure-control valves serve a dual function of pressure control and dump, to insure a constant supply pressure, and continuous working of the wells.

Source water is piped from the desanders through plastic-coated steel pipe to the pumping plants. The water is chemically treated by proportion feeders at the source wells and at injection pump suction valves.

The water is treated to inhibit corrosion in the pumps and distribution system, and to prevent bacteria growth in the entire system.

The water distribution system consists of steel pipe running above ground where possible, and underground when barriers prevent surface installation. An orifice-type meter at each well head measures and records the injection flow.



BULK TRUCK is loaded at this new air-operated bulk plant at Woodward, Okla., as . . .

BJ Moves Into Mid-Continent

BJ Service, Inc., has entered the highly competitive Mid-Continent oil-well cementing field.

The company held open house at its new field station at Woodward, Okla., last week. At the same time, it took the wraps off its first air-operated bulk cement plant.

The Borg-Warner subsidiary previously had centered its cementing activities in Louisiana, South and West Texas, California, and the Rockies.

The new Woodward field station will serve as the nucleus for cementing, fracturing, and acidizing services in the rapidly expanding oil and gas producing province of northwest Oklahoma (page 22).

Key to BJ's cementing services at its new Oklahoma plant is the company-designed and company-built bulk cement plant.

The entire plant constitutes a closed-pressure system. Integral parts include 37-ft. storage silos, one blender tank, an admix tank, a filtration tank, a small underground storage space, and an air compressor.

Compressed air is used to move cement and additives through the system, and to mix them prior to delivery. No vacuum is involved.

Cement enters the system by gravity feed from a gondola car shuttled onto an adjacent rail siding.

Falling first into the small underground storage, the cement is unloaded at the rate of about 55 sacks per minute.

Once the cement has entered the system, all valves are closed and the system pressured up to approximately 30 psi.

The cement, which assumes the properties of a fluid when aerated, is blown into the silos, each of which holds 3,000 cu. ft.

At present, two of the storage silos are filled with regular cement, one with slow-set cement, and another with pozzolan. Additives are stored in the adjacent warehouse, along with supplies of acidizing and fracturing chemicals.

The blender tank serves the dual purpose of blending cement with additives, and of weighing the mixture immediately before it is discharged to the bulk cement trucks for delivery.

The entire blender tank is mounted on four legs, each of which rests on platform-type scales. The scales are read and manipulated from inside the warehouse.

The admix tank, most of which is underground, is located in the warehouse, facilitating hopper loading of sacked additives, such as calcium chloride and gels, without exposure to inclement weather.

The additives are "fluffed" by air in the admix tank before being blown to the blender tank for blending with cement or pozzolan.

A control panel, also located inside the warehouse, controls air-operated valves throughout the system.

Tool Perforates, Fracs at Same Time

A tool that perforates casing and fractures a formation, all in a single operation, has been developed by Oil Tool Engineering Corp., of Dallas.

Bruce Gilbert, head of the newly formed company, claims Stereo-Frac, as it is called, is the first tool to utilize jet-produced shock waves as a source of energy.

This, he believes, is its most important feature. While it makes four closely grouped casing perforations, this is merely "incidental" to its main function of actually fracturing a pay zone, Gilbert adds.

The developer believes Stereo-Frac will enable operators to develop pay zones with fewer spaced perforations because the tool does the fracturing work itself.

The tool is 3¼ in. in diameter. Inside are four jet charges. These charges are grouped and angled, and have their firing timed so that the high-energy shock waves created by their jets make the fracture and control the fracture plane.

The tool provides added exposure when it shoots its charges into the pay zone, with the resulting fracture serving as a flow duct with direct drainage passages through the perforations.

"The industry has been moving toward fewer perforations in a pay zone to provide more positive control in fracturing," says Gilbert. "We think Stereo-Frac will afford a big 'leapfrog' jump in this direction."

Design of the new process is based on the fact that each jet, being supersonic, produces a shock wave as it penetrates.

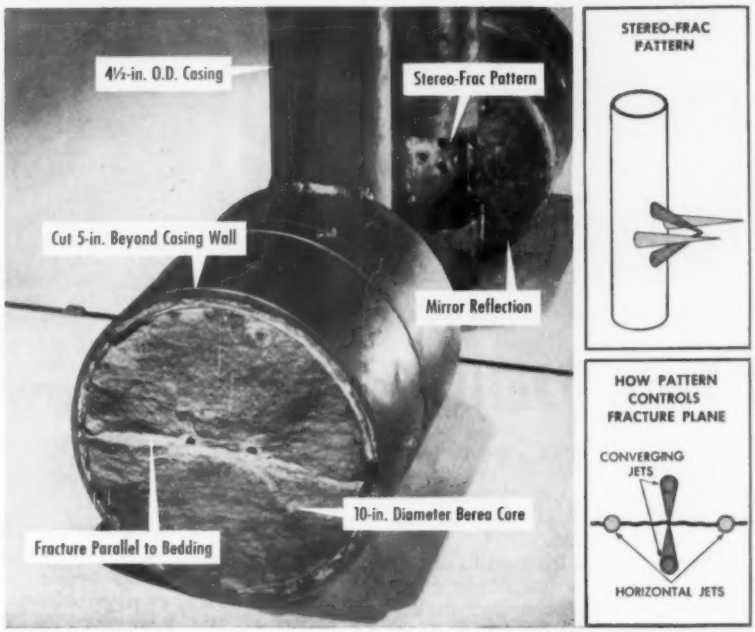
As the name implies, says Gilbert, high-energy sound waves from several directions are employed.

A wave of great intensity results upon the focusing of two jets upon a point of collision. It is the timed and directed collision of these waves, interacting with the directed waves from the other two jets, which Stereo-Frac employs to fracture formations.

Two jets are directed into the formation along parallel axes lying in the desired plane of fracture. They are timed sufficiently in advance of two other converging jets for their shock waves to be in the immediate vicinity at the time of collision of the converging jets.

The co-action of these waves as they coincide produces a fracture. The resulting fracture extends beyond the perforations, both axially and laterally.

After the fracture is made, says Gilbert, it can be extended in the already-established plane by conventional fracturing at normal injection pressures. The four perforations made, he adds, are of sufficient capacity for high-injection-rate treating. He notes that at 15 bbl. per minute per fracture, the pressure drop is only 300 psi.



"STEREO-FRAC" makes four closely grouped perforations (note mirror reflection). Co-action of multiple shock waves (drawings) create fracture in desired plane.

The tool can be run on a conventional wireline, along with logging or casing collar-locator tools.

Gilbert says the tool is adaptable to any wireline service company's cable head, in all sizes of casing or open hole of 3½-in. diameter or larger.

The tool has a 5-ft. chamber immediately above it which serves as a shock absorber. This chamber protects instruments from the explosive shock, enabling operators to run instruments at the same time the well is Stereo-Fraced.

A drag spring assembly mounted on the body of the tool maintains a uniform relation to the casing wall.

The jets in the tool are electrically fired in the conventional manner.

The tool has been tested in the tough Clinton sand of north-central Ohio.

The Clinton sand, which one Gilbert associate says "has been eating everybody up," is a very tight, dense formation found at about 3,500 ft.

Gilbert says Stereo-Frac has encountered no particular problems in this sand as yet.

Typical remarks from operators, according to Gilbert, have stressed low initial and injection pressures required with Stereo-Frac.

In one of the tests, breakdown pressure was 1,000 psi., injection pressure was 2,200 psi., and injection rate was 45 bbl. of water per minute.

Both of these tests were run in 4½-in. pipe. In one test run in 5½-in. pipe, breakdown pressure was 2,000 psi. and injection pressure was 2,400 psi., with 34 bbl. of oil used per minute.

Another test showed breakdown pressure of 2,300 psi., injection pressure of 1,500 psi., and injection rate of 32 bbl. of oil per minute.

With conventional methods, 40 shots would have been required, on the average, with breakdown pressures ranging between 3,500 psi. and 4,000 psi. With Stereo-Frac, three Stereo guns were used per job, and breakdown pressures averaged from 1,800 psi. to 2,000 psi.

Oil Tool Engineering will sell the tool to established wireline service companies; the company itself does not provide service facilities to run the equipment.

Gilbert, who has been engaged in this work since 1948, was formerly associated with Welex, Inc., and The Western Co.

RIG MOVES IN to spud Amerada Oil Corp. No. 1 Biever in central portion of a county-wide Oklahoma drilling play where . . .

Deep Drilling Sparks Dewey County

Oklahoma's Dewey County is now a significant factor in the razzle-dazzle play that has characterized the state's portion of the Anadarko Basin in recent years.

During the first ten months of this year, Dewey and a few nearby counties have bucked the over-all drilling trend in the basin, which is down some 550 starts below last year's pace.

Virtually all of the land in the county is under lease, much of it to major oil companies.

Deep drilling appears to be the key to success in the county.

Some sporadic deep drilling was done back in the 1940s. But most holes failed to go deep enough to hit Pennsylvanian gas formations.

One Mississippian and seven new Pennsylvanian reservoirs have been opened in Dewey County in slightly more than a year.

Success ratios have been high, with better than 90% of the wells being completed in more than one zone.

The majority of the Dewey County completions have been for gas.

The chances of striking gas, says one geologist, far outweigh the chances for striking oil. But since some oil in commercial quantities has been found, no one is completely eliminating the possibility of hitting sizable oil deposits.

The Pennsylvanian, so far, has been the most fruitful formation in the county.

The best pay zones of this age have been the Morrow and Oswego.

A recent exception to this is Mobil Oil Co. No. 1 Herring, section 22-16n-16w. On an 80-minute drillstem test through ⅜-in. choke, it flowed an estimated 5.7-million cf/d of gas, decreasing to 4.4-million cf/d by the end of the test.

The test was made in the Chimney Hill section of the Hunton (Silurian) at 14,474-604 ft.

Virtually all pre-Pennsylvanian tests have been drilled on seismic highs, but Pennsylvanian pools appear to be almost always stratigraphic.

There is little doubt that Mobil's Hunton discovery is on a large structural anomaly discovered by the same company's No. 1 Miller, across the line in Custer County (PW—May22 '59,p18).

"There's little inducement," says one geologist in the area, "to drill below the Chester (Mississippian) unless done on the basis of seismic interpretations that indicate deep-seated structure."

Pennsylvanian geology in Dewey County is typical of that found throughout much of northwest Oklahoma.

Sediments were deposited by a transgressive sea, with hydrocarbon entrapments the results of facies changes, lensing, and related stratigraphic phenomena.

Most of the current activity in the county is centered in and around Putnam field, although two companies are making Chester lime tests near West Valley Center field.

Carter Oil Co., at last report, was spudding No. 1 Spangler, 4 mi. west of Sinclair's No. 1 Collier, a confirmation well in West Valley Center field.

And Amerada Petroleum Corp. is rigging up at Amerada No. 1 Biever, about 4 mi. north of West Valley Center field, and just 1 mi. southwest of Amerada No. 1 Brewer.

No. 1 Brewer was recently dually completed for 2.5-million cf/d of gas through 19/64-in. choke and perforations at 10,302-332 ft. in the Morrow and for 1.1-million cf/d through ⅜-in. choke and perforations at 10,358-78 ft. and 10,390-94 ft. in the Chester.

Here's what's happening in the Putnam area, from latest reports:

- Union Oil Co. of California No. 1 Robertson, section 9-16n-17w, was being tested through perforations in 7-in. casing at 9,532-94 ft. in the Oswego. Latest test showed 3.8-million cf/d plus 237 b/d of condensate through 24/64-in. choke.
- Sinclair No. 1 King, section 23-16n-17w, was being prepared for perforations in the Oswego, which had only slight shows on drillstem tests but looked promising on logs.
- Texaco Inc. recently completed No. 1 Devereaux, 2 mi. northwest of Oakwood townsite in the eastern part of the county, for 9.9-million cf/d of gas plus 241 b/d of condensate through ½-in. choke and perforations at 9,490-510 ft. and 9,516-76 ft. in the Morrow.

Dewey County got its first field in early 1957, and its second last December.

Sinclair opened West Valley Center with the completion of No. 1 Kunc, section 11-17n-18w, for 3-million cf/d plus 103 b/d of oil through perforations at 9,159-213 ft. in the Oswego.

The field confirmation—Sinclair No. 1 Collier—was dually completed for 1-million cf/d from the Tonkawa and for 9-million cf/d from Oswego.

The second field—Putnam (Morrow)—was brought in by Union Oil's completion of No. 1 Irwin, section 10-16n-17w, for 4.7-million cf/d through perforations at 11,211-22 ft. and 11,232-42 ft. in the Morrow.

The play gained momentum last spring when a dual Oswego and Morrow oil and gas discovery was made 3 mi. northwest of West Valley Center field.

What's New / IN PRODUCTION

Montana Orders 40-Acre Spacing Statewide, and...

The Montana Oil & Gas Conservation Commission has ordered 40-acre spacing on a statewide basis.

In giving the order, a commission spokesman said the new ruling will "eliminate many of the inequities that existed under the old statewide rule, which enabled the drilling of nine wells per 160 acres."

Among those opposing the change was L. R. Hannah, of Shelby, who said:

"Independent operators and Montana taxpayers are already laboring under staggering economic handicaps.

"Due to recent crude oil price cuts, we are receiving less for our crude than is being paid anywhere else in the nation for similar crude.

"On top of that, our per-barrel state taxes are higher than in any other state."

•

. . . Utah Considers It

A decision in the long-standing controversy over spacing—40 acres versus 80 acres—in Utah's Aneth area is expected some time after Jan. 1.

Members of the Utah Oil & Gas Conservation Commission have said the issue will be settled in the current hearings.

Five major oil companies are seeking to keep spacing at 80 acres in the area, which has a production of between 90,000 b/d and 100,000 b/d from 490 wells.

Shell Oil Co. is providing the main force toward 40-acre spacing.

About six months ago, the commission said that, subject to new evidence, it would order 40-acre spacing, the standard for most Rocky Mountain fields.

Companies wanting to keep spacing at 80 acres say there is lateral and vertical communication in the limestone reservoir at Aneth, which is proved, they say, by new wells showing lower reservoir pressures.

Shell, which drilled five wells on a 40-acre spacing test granted by the commission, maintains there are "islands" of oil that will be untapped unless closer spacing is applied.

If the decision favors 80-acre spacing, Shell will not be able to produce from the five wells, which cost $750,000.

Companies asking retention of 80-acre spacing are Continental, Superior, Texaco, Phillips, and Carter.

•

Republic Natural Gas Co. and Harper Oil Co. have purchased 17 oil wells from Lincoln Drilling Co. and others for $1 1/4-million.

The wells are located on a 1,000-acre lease in East Happy Hills field, Lincoln County, Okla.

Republic will hold a 75% interest in the properties, and Harper will have the remaining 25%.

•

Independent operators in New Mexico are studying the state's ratable take laws, unconnected wells, and natural gas prices.

The Independent Producers & Royalty Owners Assn. is setting up committees:

- To investigate the possibility of strengthening the ratable take laws by introducing legislation in the next session of the state legislature;
- To make a survey on the status of unconnected wells (which would include a survey on trucking and its costs); and
- To study dry gas prices, which vary as much as 7¢ per Mcf. in some parts of the state.

•

The Texas Railroad Commission has been asked to approve a waterflood-pressure maintenance program that's expected to more than double ultimate recovery from Abell (Devonian) field, Pecos and Crane Counties.

George T. Abell and William B. Neely say the program would boost recovery from 8.2-million bbl. to 17.6-million bbl.

Proposed injection would be into the 5,100-ft. Devonian formation at a rate of 40,000 to 60,000 bbl. per month. There are 17 wells in the field.

•

A Humble Oil & Refining Co. drilling rig is said to be the world's safest—having completed 566,000 man-

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November 11, 1959.

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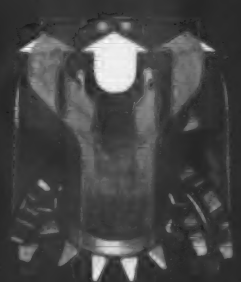

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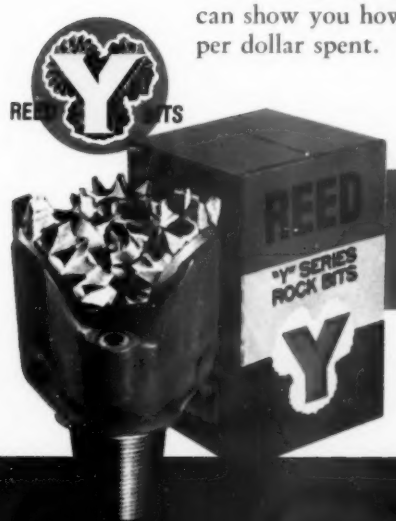

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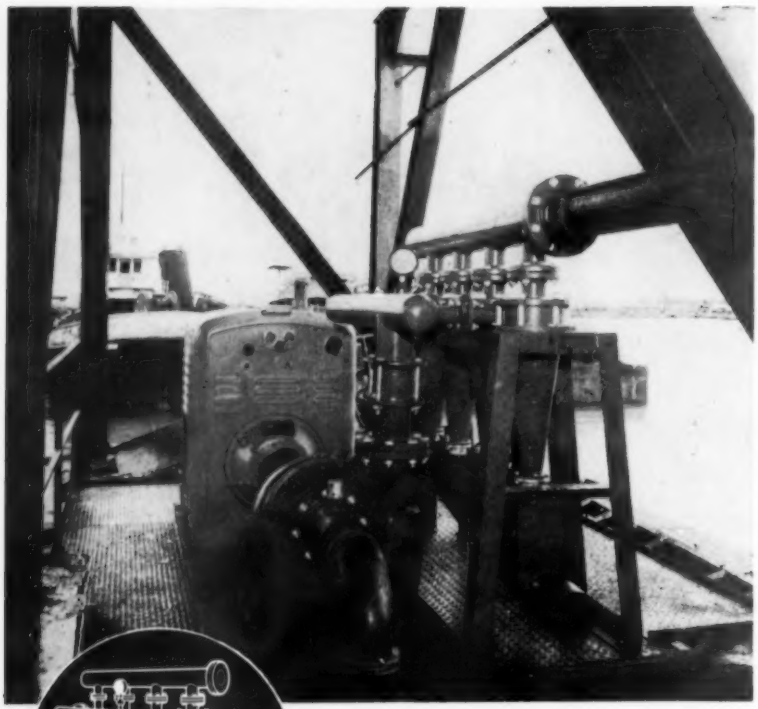

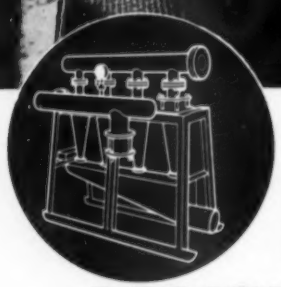

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hours of work without a single disabling injury.

The rig, No. 39, was used to drill 53 holes, with a total footage of 687,385 ft. It has been used offshore, onshore, and on inland barges over the past ten years.

Its present location is in Lake Raccourci, Lafourche Parish, La.

•

Alberta's oil and gas industry, which has taken a big share of the energy market from the province's coal industry, is heaping insult upon injury by finding large coal deposits while looking for oil and gas.

A provincial industrial report says: "Seismic surveys exploring for oil and natural gas are constantly revealing large coal seams in areas previously believed to be barren of coal, and adding to the known reserves of regions prospected in the past."

Coal output, the report added, has fallen from a high of about 8.5-million tons per year in 1946-1949 to about 3-million tons in 1957.

"This," adds the report, "is the direct result of very large oil and gas pools in Alberta and the consequent loss of several major coal markets to these competitors."

Alberta's mineable coal reserves are estimated at 47.8-billion tons.

•

Sales of natural gas from British Columbia are almost $1-million ahead of last year, and crude sales have almost doubled, according to the provincial Dept. of Mines & Minerals.

Gross value of natural gas sales amounted to $307,005 in September and $3,293,478 for the first nine months of the year, compared to $276,658 and $2,751,739, respectively, last year.

September crude sales totaled $149,923, making a nine-month total of $1,112,552, compared with $104,441 and $674,540 last year.

•

Drilling Highlights

Colorado—Big Horn Powder River Corp. and Hathaway Co. No. 4 USC, section 11-37n-20w, Montezuma County, flowed an estimated 336 b/d through 2-in. tubing and perforations at 5,532-43 ft. in Lower Paradox. The Pennsylvanian discovery is 13 mi. north of Lion Oil's Flodine Park discovery.

Also in Montezuma County, Phillips Petroleum Co. No. 2 Desert Canyon, section 11-34n-20w, flowed

280 b/d of 41-gravity oil through ¾-in. choke and perforations in the Paradox at 5,902-17 ft. The discovery is 5½ mi. south of Flodine Park field and 1½ mi. north of Marble Wash, where the first oil discovery in the Colorado portion of the Paradox Basin was completed as a small producer.

West Texas—Texaco Inc. No. 1 M. S. Jones, section 12, block A7, psl survey, Gaines County, was completed for 361 b/d for 42.6-gravity oil through 22/64-in. choke and open-hole section at 11,100-15 ft. in the Devonian. The discovery is 2½ mi. southeast of Jones Ranch field.

In Scurry County, G. Scott Hammonds No. 1 J. Holladay, section 75, block 20, Lavaca Navigation Co. survey, flowed at the rate of 280.8 b/d of oil on test through 12/64-in. choke and perforations at 7,307-17 ft. in a Pennsylvanian reef. The discovery is 3½ mi. south of Diamond M field.

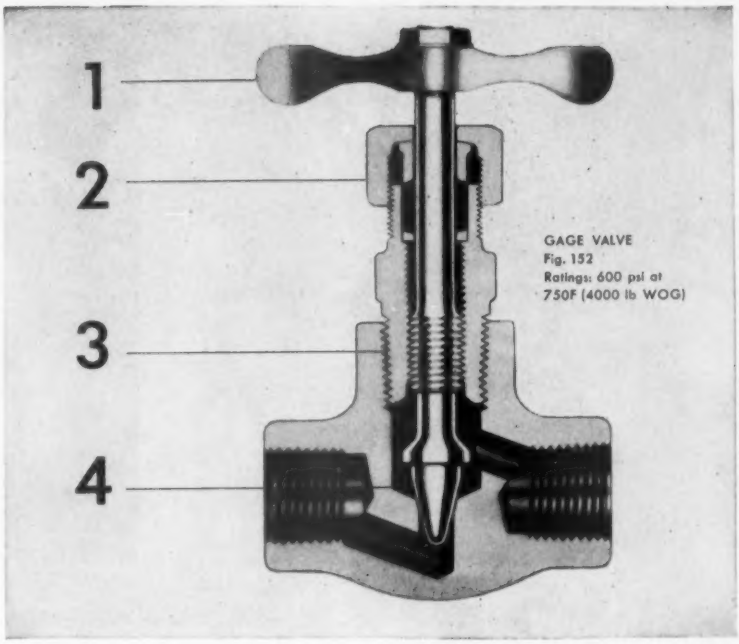
Wyoming—El Paso Natural Gas Co. No. 1 Patrick Draw Unit, section 1-18n-99w, Sweetwater County, flowed 637 b/d of oil through ¾-in. choke and perforations at 5,182-98 ft. in the Almond. The discovery is 7 mi. south of an Almond discovery by Texas National Petroleum Co. in the West Desert Springs area.

Nebraska—Petro-Lewis, Ltd., and Joe Henry Morris No. 1 Pile, section 12-17n-55w, Banner County, yielded oil at the rate of 15 to 20 bbl. per hour on the swab. Production is through perforations in the J sand at 6,150-55 ft. The discovery is 2½ mi. northeast of Weaver field.

Kansas—R. G. Lawton No. 1 Liebbrant, section 36-3s-42w, Cheyenne County, yielded 44 bbl. of oil on the pump on 12-hour test of the Lansing-Kansas City at 4,503-10 ft. The discovery is 2¾ mi. south of Pennsylvanian production at Rueb field.

Arkansas—Gulf Oil Corp. No. 1 Bauman, section 13-9n-22w, Pope County, was completed for 5-million cf/d of gas on open flow from the Atoka at 4,531-38 ft. The discovery is 3 mi. north of Knoxville field.

Texas Panhandle—A. R. Dillard No. 1-B Allen Estate, section 17, block 12, H&GN survey, Ochiltree County, was completed for 215.7 bbl. of 40.8-gravity oil in 20½ hours through ½-in. choke and perforations at 6,688-732 ft. in the Cleveland. The pay discovery, in West Perryton field, is 2½ mi. southwest of Cleveland production at Sunray Mid-Continent Oil Co.'s No. 1 J. E. Hirleman.



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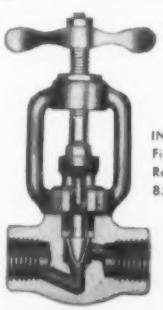
Edward instrument valves have a carbon or 13% chromium stainless steel body. Carbon steel body has an integral cobalt-chromium-tungsten alloy steel seat that resists pitting and gives maximum resistance to corrosion and erosion. You have a choice of screwed or socket welding ends.


INSTRUMENT VALVE
Fig. 952
Ratings: 2500 psi at 850F (6000 lb WOG)

MANY FEATURES:

1. **Contoured T-handle on both gage and instrument valves provides easy, finger-tip control.**
2. **On gage valves, the bonnet and packing nut are EValized (exclusive Edward plating process) to minimize galling and corrosion. Instrument valves have EValized gland and gland bolt nuts, stainless steel gland bolts.**
3. **Taper-threaded joint between bonnet and body of gage valves prevents bonnet from backing out of valve. Instrument valves are of bonnetless design.**
4. **Semi-needle, integral stem-disk is made of EValloy 13% chromium or 18-8 alloy stainless steel, hardened for wear resistance on both gage and instrument valves.**

For additional information, see your favorite distributor, or write to Edward Valves, Inc., 1236 West 145th Street, East Chicago, Indiana. Subsidiary of Rockwell Manufacturing Company.

EDWARD STEEL VALVES
another fine product by
ROCKWELL

PIPE COATINGS are tested for strength by Service Pipe Line.

POLYETHYLENE COAT is extruded on pipe by Republic Steel.

Plastic Coatings Fight Pipe Corrosion

Some important developments are in sight in the methods and materials that will be used to protect pipe against external corrosion.

In recent years, pipeliners and pipe makers have given high research priority to finding cheaper, stronger coating materials and methods than are now available.

Pipe precoated with synthetic resins may be available from pipe manufacturers in a wide range of sizes within a year, according to industry sources.

"It should be only a matter of time now," says one pipeliner, "until the vast amount of research data built up over the past few years are translated into terms of practical application."

Several major pipeline companies, plus pipe and paint manufacturers, have been experimenting with synthetic coatings for several years.

Emphasis is on finding the best techniques of applying the coatings.

Republic Steel Corp. is already selling a polyethylene-coated pipe. And at least three other major steelmakers are known to be planning similar products.

Both basic types of synthetic resins —thermoplastic and thermosetting— have been used successfully in other industrial applications for years, but only on a limited scale in pipelining.

The thermoplastic group comprises primarily polyethylenes and vinyls. They are used in a variety of consumer goods, and in insulation for underground cables.

The thermosetting group includes blends of coal tar with epoxies or butoxies. The former have become important components in protective coatings for marine and chemical installations.

In both laboratory and pipeline field tests, the synthetic coatings have shown high puncture strength, good ability to withstand soil stress, good surface adhesion, and light weight.

Service Pipe Line Co., a subsidiary of Standard Oil Co. (Ind.), lab-tested the strength of coatings by exerting pressures against them with blunt rods (picture, above left). Extruded polyethylene and tar-epoxy coating were scarcely dented, Service reports, while other types were completely penetrated.

Service's laboratory tests with synthetic resin coatings have shown them to have unusually good adhesion.

Many types of film offer good corrosion protection as long as they remain intact. But the slightest break in the film—or "Holiday", as a coating crack is known in pipelining—allows water to work under the coating and peel it off.

Epoxies have been found to bond so tightly that they are used in aircraft manufacture.

The fact that synthetics can be applied effectively to pipe in very thin coats cuts over-all weight. Lighter weight means lower shipping charges.

Republic Steel Co., the only major pipe maker to sell synthetic resin-coated pipe so far, has already sold 16-million ft. of its X-Tru Coat pipe in diameters up to 5 9/16 in.

The X-Tru Coat is an extruded, high-density polyethylene. Its development started six years ago.

The greater part of this coated pipe has gone to local gas distribution firms. A small amount is being used in natural gas gathering systems.

Republic plans to start marketing the pipe in diameters of 6⅝ in. and 8⅝ in. by mid-1960.

And the company doesn't plan to stop there.

"With the cost of petrochemicals being steadily reduced, the company may eventually extrude coatings over pipe suitable for 'big inch' transmission lines," a Republic official says.

He reports that all mechanical hurdles in coating the pipe have been cleared.

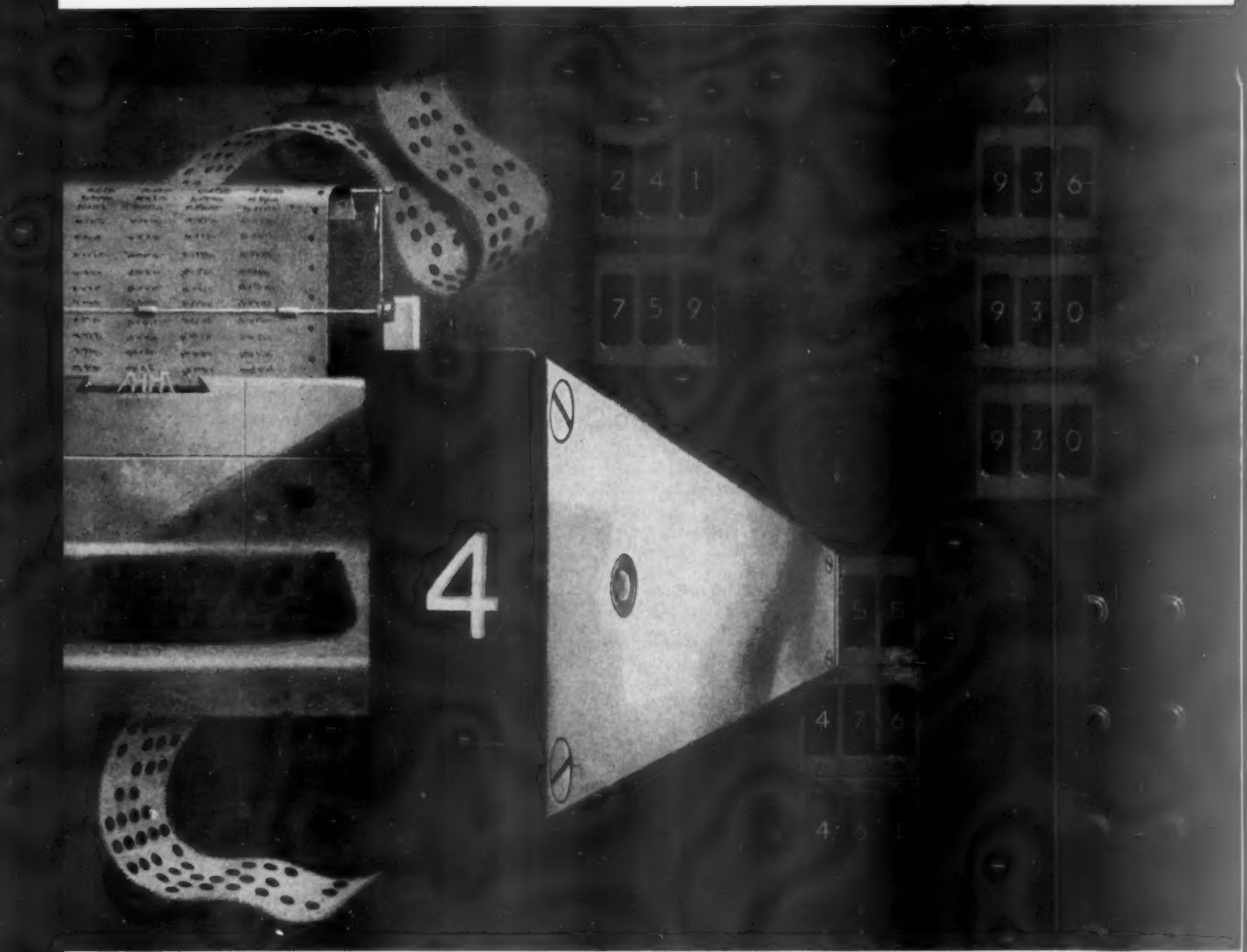
Up to now, cost has limited the use of synthetic resins, he says. He adds, however, that this obstacle is fast being surmounted.

Service Pipe Line Co., one of several pipeline concerns that is trying "thin-film" coatings, has had several miles of test pipe underground for from several months to several years.

It expects the coatings to last about 15 years.

Final test results won't be in until then. The pipe coatings are uncovered from time to time, however. Service's report: They're in good shape.

Service is testing three kinds of



NEW CONTROL CONCEPT
can cut your pipeline costs

Did you ever try to solve a jigsaw puzzle without first looking at the total picture the puzzle makes? Pretty difficult—maybe even impossible. Best way, easiest way is to look at the big picture first, then see where the individual pieces fit.

It's the same with pipeline control.

First, look at your total system problem. Then, determine what sort of control system is required to safely, reliably and economically meet tomorrow's need as well as today's. That is Union Switch & Signal's approach to pipeline control.

Any part of a pipeline system. Union Switch & Signal can incorporate in a centralized control system any or all of the following functions: supervisory or remote control of satellite stations . . . telemetering of flow data from field back to your central dispatching office . . . automatic sequencing or control of equipment in the field . . . instrumentation . . . data handling and display . . . computing equipment . . . automatic integration of field data into your accounting operations . . . communications. Union Centralized Transport Control can be adapted to *any* problem from remote control of a single-unit booster station for gas or oil to automatic centralized control of an entire system from wellhead to ultimate consumer.

Error-free. Whatever the job assigned to it, Union Centralized Control operates completely free from error because it reduces to coded digital form all information and instructions transmitted to or from your central control office. As a result, you can transmit far more precise data than ever before; you can use the least expensive available communications service; and you never need to worry about lightning, noise or other interference causing a wrong or dangerous operation—this coded system automatically checks itself and responds *only* to correct and logical signals. It helps make your pipeline safer. It provides error-free *security* as well as reliability.

Lower operating cost. Most important, Union Centralized Transport Control cuts your operating costs, cuts the cost of future expansion, sometimes even cuts present installation cost of pumping stations.

Write for Bulletins PD 2006, PD 2007 and 1052

"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
PITTSBURGH 18, PENNSYLVANIA

coatings. In Kansas, it has had 2 mi. of trunk line, coated with pressure-sensitive polyethylene tape, in the ground for about two years. Near Albany, Tex., about 2 mi. of thin-wall gathering line, with an extruded plastic covering, has been underground for about one year. And at different points along its system, the company has had a total of 5 mi. of tar epoxy-coated line in service for 3½ years.

There are two basic methods used to apply thermoplastic synthetic resin coatings to the pipe—extrusion of the coating onto the pipe (picture, page 28, right), and wrapping with plastic tape.

The extrusion process takes five steps: cleaning the pipe with a grit blast, treating it with heat, applying an adhesive undercoating, extruding the softened plastic over the pipe, and cooling the coating with water.

The only plastic tapes used so far on a large scale for pipeline coverings are the pressure-sensitive varieties, in thicknesses of from 12 to 14 mils.

The most practical way to put on thermosetting resins is by spraying.

In this method, the pipe is heated after the coating is sprayed on—instead of being cooled, as with thermoplastics. Another difference is that no adhesive is needed.

Some big obstacles to full-scale production of synthetic resins coatings have arisen.

Among them are the problems of reducing drying time of the coatings and increasing the length of time the coating will remain liquefied before it's applied.

Both these problems are particularly acute in field application of coatings.

M. J. Crose Mfg. Co., of Tulsa, is searching for a catalyst to speed up drying of tar-epoxy coatings, with a view toward field application.

The company has coated about 10 mi. of pipe in a pilot project.

Best drying time so far has been 15 minutes—which is too long for ditch-site application.

"If the set time can be shortened to less than five minutes through better catalytic control, line-travel operations would then become feasible," a company spokesman says. "We feel it's only a matter of time until paint companies achieve this."

Allied Paint Co., of Tulsa, says that it has developed a new type of tar-epoxy coating that sets in five to ten minutes, if both the coating and the pipe are preheated to about 120F.

Allied's coating is made under license from Pittsburgh Coke & Chemical Co., developer of tar-epoxies.

Its biggest advantage is that it contains less solvent than other types, thereby reducing shrinkage on the pipe.

The set time problem apparently hasn't been completely licked, however, and this problem is complicated by another difficulty—lengthening the time the epoxy will remain in a liquid state in the field.

Before it's agitated, Allied's formulation is of a heavy, plastic-like consistency. When it's agitated, however, it breaks down, so that it can be sprayed with standard equipment.

Once a catalyst has been added to aid setting, however, the "potlife"—or length of time the material will remain "sprayable"—drops to three or four hours.

Somehow, pipeliners feel, ways must be found to shorten set time, while lengthening potlife.

Cost, a major deterrent to the use of synthetic resins in their initial development stages, is dropping.

One manufacturer told PETROLEUM WEEK that he would sell all the coal tar-epoxy he could make at less than $5 a gal.

When coal tar-epoxies first came on the market, the price was about $7.50 a gal.

The price of polyethylene coatings reportedly is also dropping.

"Pipeline companies are firm in their belief that even the most revolutionary new coatings will not eliminate the need for cathodic protection," says James Hunter, head of Service Pipe Line's corrosion section.

"Practically all major pipelines in the country now are protected throughout their entire length by coatings, coupled with rectifiers or galvanic anodes," he explains.

Coating costs are a fixed and immediate investment. Cathodic protection, on the other hand, is largely an operating expense. Cost of the latter is relatively small during the early years of a pipeline, but gradually increases over the years as coating deteriorates.

Coating costs, therefore, are borne with the expectation that they ultimately will reduce the amount of cathodic protection needed. Pipeline management isn't inclined to boost cash outlays by very much to cut operating costs 10 to 15 years in the future.

For this reason, synthetic resins must compete not only on the basis of performance, but also from a cost standpoint.

What's New / IN PIPELINES

In a quick decision last week, the Federal Power Commission authorized Transcontinental Gas Pipe Line Corp. to spend $53,373,449 for loops on its two mainlines and additional compressor horsepower.

Transco had filed its application only the week before (PW—Nov.20 '59,p41).

In its ruling, FPC also OK'd gas prices Transco will pay Louisiana producers, over the objections of Commissioner William Connole.

FPC's attitude toward Transco wasn't all favorable, however. In an accompanying statement, FPC hinted strongly it would appeal to the Supreme Court a lower court's reversal of its denial of Transco's proposal to transport to New York gas bought in the field by Consolidated Edison Co. (PW—Nov.13'59,p22).

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Tennessee Gas Transmission Co. will seek authority to trade gas with Trans-Canada Pipe Lines, Ltd., if and when necessary, through an existing spur under the Niagara River.

In a petition soon to be filed with the Federal Power Commission, TGT will ask permission to activate the spur, which links with a spur of Trans-Canada at mid-river.

TGT had been supplying gas through the spur to eastern Canada for Trans-Canada up until last year, when the latter completed its line from Western Canada.

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Correction

The Bucyrus-Erie pipeline equipment recently shipped to Iraq will be used on two separate Iraq Petroleum Co. pipeline projects. They are not linked in any way, as implied in PETROLEUM WEEK (PW—Oct.2'59, p48). One, in the north, is an expansion of the Kirkuk-Mediterranean line. The other, in the south, is a line that will run from Basra to a new offshore terminal in the Persian Gulf.

Tuition Supplements—

One Good Way To Help Our Colleges And Universities

The business community has made an impressive start in going to the desperately needed financial aid of our colleges and universities. Business contributions to higher education have increased from only $40 million in 1950 to $136 million in 1958.

This rise in financial aid to higher education should be a great source of satisfaction to the business community. But it goes only part way toward meeting the growing needs of colleges and universities for financial help. Over the next ten years business aid to our privately supported colleges and universities alone must increase to at least $500 million a year merely to provide decent faculty salaries and meet the increased operating costs of taking care of enrollments that will almost double.

One pervasive reason why many business firms have not joined the ranks of the companies contributing to higher education seems to be that, in the interest of prestige and public relations, they are making their provision of aid contingent upon finding some particularly novel way of providing it. So long as this point of view persists, business aid will lag, for there are simply not enough ways of providing financial aid that are both notably novel and sensible.*

How The Plan Works

There are, however, some well-tested ways of providing aid which improve rather than fade in appeal with more using. One such way is the making of supplemental tuition payments to colleges and universities at which a company's employees take courses.

Many companies have scholarship or tuition-refund programs which cover all or part of the costs to their *employees* of taking college courses. But, in most colleges and universities, tuition charges fall far short of covering the full cost of the education given. By making an unrestricted "cost-of-education" grant a part of their employee scholarship or tuition-refund plans, these companies could make a material contribution toward covering the *college's* full costs as well.

The tuition supplement can be a fixed amount or a percentage of the tuition charged. Some plans provide for supplements as high as 100% of tuition, though there is usually an upper limit to the total supplemental payment given for each employee enrolled in the institution.

The plan seems to have originated with the Ford Motor Company Fund. When we at McGraw-Hill first learned of it, it appealed to us as having so many advantages, and so few disadvantages, that we adopted it as one part of our own program of financial aid.

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*The efforts of the McGraw-Hill Publishing Company to find a suitable method of aiding higher education prompted the writing of a "more or less Socratic dialog" entitled *A Business Wrestling with the Problem of Aid to Colleges and Universities*. Copies of this pamphlet, which underlines the difficulty of finding both a novel and satisfactory method of providing aid, are available on request.

HOW THE HEADS OF SOME OF THE INSTITUTIONS TO WHICH McGRAW-HILL HAS MADE GRANTS FEEL ABOUT THE TUITION SUPPLEMENT PLAN

"We are pleased not only because this addition to the never adequate supply of non-earmarked funds is a most welcome one, but also because it attests to the fact that the employees of our neighboring business firms are benefiting from the courses we offer at times convenient for them. We hope this mutually beneficial plan may continue and grow with the years."

Grayson Kirk, President
Columbia University

"I shall take this occasion to express deep sentiments of appreciation, in my own name and in the name of the members of the Board of Trustees, for the very effective manner in which your corporation is aiding higher education by the payments made under your tuition supplement plan. Certainly your action is indicative of the fact that you realize industry and higher education must join forces to preserve the basic American system of free enterprise."

Very Reverend John A. Flynn, C.M.
President, St. John's University

"The growing recognition by business and industry of the financial needs and important services rendered to the community by the colleges and universities is most encouraging, and Temple University is deeply appreciative of the fine support extended through McGraw-Hill's program of supplementary grants."

Robert L. Johnson, President
Temple University

The Plan's Advantages

The main advantages of the tuition supplement plan are:

- **It is simple and easily administered.** Payments can be made when scholarships or tuition refunds are granted, or at another time convenient to the company.
- **It relieves the company of the difficult and sometimes disagreeable task of choosing one college rather than another.** The individual employee makes the choice.
- **It directly serves the interest of the company by encouraging and aiding the institutions where its employees take courses.** In a sense, the company makes contributions in direct proportion to the value it receives in education for its employees.
- **It directly serves the interest of the colleges and universities receiving the grants by getting money to them in the form most appreciated**—unrestricted funds to be used at the discretion of their administrators.

Largely because tuition supplements are unrestricted as to use, this plan enjoys the unqualified approval and gratitude of the schools receiving such aid. This is not true of some of the other plans for granting aid to colleges and universities.

Tuition supplements, of course, can't be regarded as large efforts relative to the need of higher education and the responsibilities of business. But they are a very practical and useful first step, involving almost no problems. If you are not familiar with the idea of supplemental grants, why not discuss it with some of your friends in the field of higher education?

The Price Of Novelty

Our experience with tuition supplements indicates that this is an excellent plan, and we are glad to recommend it to other companies looking for an effective method of providing financial aid to higher education.

At any rate, we hope that business firms will not postpone granting financial aid until they find some novel way of doing it. If they do, it will be another case of too little and too late.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw
PRESIDENT
McGRAW-HILL PUBLISHING COMPANY, INC.

Now...
an expanded line of

OTIS PRODUCTION PACKERS and COMPLETION TOOLS

for conventional, dual-zone, P.T.W.C., and slim-hole completions

OTIS DRILLABLE PRODUCTION PACKERS

The Types TB, TE, and WA Otis Drillable Production Packers are identical in construction and sealing effectiveness, and differ only in the setting mechanism and setting technique. All have a large bore and are designed for easy milling or burning over or drilling out. The Types TB and TE are designed to be set on tubing or drill pipe. The Type WA is a wire line set packer.

TYPE RA OTIS RETRIEVABLE PACKER

The Type RA Otis Retrievable Packer is a compact, economical production packer that can be used in treating, fracturing, or water flooding operations, as well as in producing wells. It may be set in tension or compression without modification.

TYPE HS OTIS RETRIEVABLE ISOLATION PACKER

The Type HS Otis Retrievable Isolation Packer is designed to be set hydraulically by pressure from within the tubing and then held expanded by a mechanical lock. Any number of these packers can be made up and run in on a single string of tubing, and then set and tested individually.

OTIS RETRIEVABLE SLIM-HOLE COLLET-TYPE PACKER

The Otis Retrievable Slim-Hole Collet-Type Packer is designed for use in permanent-type, tubingless well completions and in wells where high pressures and/or temperatures pose a problem. The packer may be run, set, pulled, and reset in different nipples located in the pipe, by wire line methods.

TYPE BC OTIS WIRE LINE BRIDGE PLUG

The Type BC Otis Wire Line Bridge Plug is designed to provide a positive fluid shut-off from either direction in a well regardless of depth or pressure. The Otis Bridge Plug is shorter in length and has a smaller O.D. than other bridge plugs now in use which means less material to be drilled when the plug is removed.

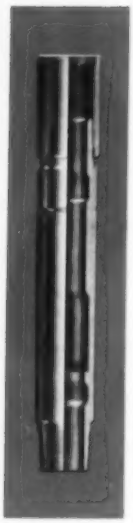
OTIS RETRIEVABLE CASING COLLET-TYPE PACKER

The Otis Retrievable Casing Collet-Type Packer is ideally suited to wells where high pressures and/or temperatures make the use of slip-type packers impractical, where the packer must be moved often, or in crooked or directional holes. The packer may be run, set, and retrieved on the tubing or by wire line methods.

PRESSURE CONTROL — OTIS — SERVICE — EQUIPMENT

OTIS ENGINEERING CORPORATION

These OTIS production tools can help solve your completion problems



LANDING NIPPLES

The Otis Selective Landing Nipple is one of the most essential pieces of equipment in use today for producing flowing oil and gas wells. It provides a positively-located seat for landing the many Otis sub-surface flow control tools which have proved so necessary to efficient oil and gas well production and remedial operations.

Otis Selective Landing Nipples are available in two different types — the Type S and the Type T — for practically any size tubing and with any type thread. The primary difference between the two nipples is that the Type T has a smaller I.D., which permits its use with heavy-walled tubing or with regular E.U.E. tubing below sub-surface equipment that reduces the I.D. of the tubing.

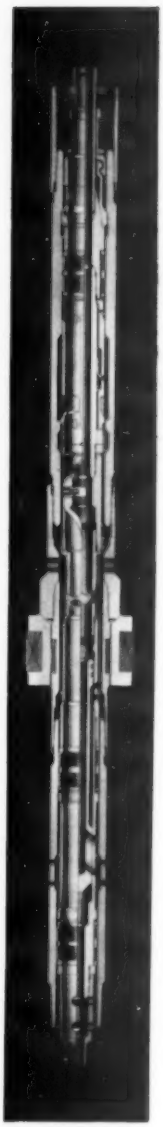
The Types S and T Otis Landing Nipples are available for use with 1.660" through 4½" O.D. tubing. Both are less than collar O.D. of regular E.U.E. tubing and the same as, or less than, the O.D. of the upset on flush-joint tubing.

SLIDING SIDE-DOORS

The Otis Sliding Side-Door is a circulating tool which permits selective communication between the tubing and the annulus. It is designed to be opened or closed as desired by wire line methods — under pressure, without killing the well, and without disturbing the packer setting. The tool is designed so that any number of Sliding Side-Doors may be made up in the tubing string and any or all can be opened or closed in a single run of a wire line shifting tool.

The Otis Sliding Side-Door is ideally suited to installation in two-zone and alternate-zone completions as it permits the selective production of any zone as it becomes desirable. The vertical slotted ports are designed to provide maximum strength and at the same time prevent distortion of the tool when it is subjected to the stress and torque of the production string.

Otis Sliding Side-Doors are available for use with 1.660" through 3½" O.D. tubing and may be supplied with any type thread.



SELECTIVE CROSS-OVER NIPPLE ASSEMBLY

for conventional or P.T.W.C. two-zone wells

The Otis Selective Cross-Over Nipple Assembly can save you the cost of a second string of tubing and a dual packer on dual producers, and at the same time provide all the necessary selectivity to produce your wells efficiently. The assembly not only affords selective tubing-annulus production of two-zone wells but permits various types of remedial operations to be performed on either zone without disturbing the packer settings. The assembly is available for use with 1.900" through 2⅜" O.D. tubing.

There are 10 different Otis chokes available for use in this selective cross-over hookup. These chokes include the regular cross-over choke to produce the lower zone through the annulus while the upper zone is produced through the tubing; a regular straight-flow choke to keep the lower zone in the tubing and the upper zone in the annulus; a dual side-door choke and a dual separation tool which permits the blanking off of either upper or lower zone and/or the annular space above the packer; an upper zone acidizing tool and a lower zone acidizing tool to permit the treating of either zone independently of the other; an upper zone ring check and a lower zone ring check which makes it possible to treat either zone without exposing the casing to treating pressure and yet permits circulating out following the treatment; a circulating tool which allows the well to be circulated with both zones blanked off, and a regular plug choke designed to plug off the tubing and withstand up to 10,000 p.s.i.

PRESSURE CONTROL — OTIS — SERVICE — EQUIPMENT

Have OTIS engineer your next well completion!

The next time you have a well completion problem, call your nearest Otis office. With more than a quarter of a century of experience in the research, design, and manufacturing of production control equipment — both sub-surface and surface — Otis has all of the knowledge and equipment necessary to help you engineer the proper well completion. Otis packers and flow-control equipment are precision-manufactured and carefully checked to make certain each tool conforms to design specifications. This is your assurance of receiving a quality product with each purchase.

OTIS ENGINEERING CORPORATION

General offices and manufacturing plant: 6612 Denton Drive, Dallas

Branches Throughout the Oil Country

Joint Arab Oil Policy Text Released

BEIRUT—The official text of a draft agreement for coordinating Arab oil policies was made public last week. It outlines a plan for tightening up on oil companies to improve both present and future concession terms in Arab countries.

The draft pact consists of 12 articles, and is labeled the "Iraqi Draft Agreement for the Coordination of Arab Oil Policies."

It was published in Beirut by the Middle East Economic Survey as the version approved recently in Jiddah at the seventh meeting of the Arab League Oil Experts Committee (PW—Nov.13'59,p108). Several of the resolutions previously reported as approved at Jiddah are included and spelled out, while one new one is added.

The new element in the draft pact now released is a proposal for government representation in management as executive members of oil company boards.

This would go further than the present situation in Saudi Arabia, where the government has two representatives on Arabian American Oil Co.'s board of directors, but with no executive powers.

Iraq, however, has been pressing recently for "executive" participation on the board of Iraq Petroleum Co.

Eleven Arab states—including two British-protected sheikhdoms—are listed as signatories to the draft agreement, a nonbinding pact which has a long way to go before it could become effective as law. (First it would have to be approved by the Arab League's Economic Council, and then ratified by each government concerned.)

The sheikhdoms on the list are Kuwait and Qatar—not members of the Arab League—whose external affairs are handled through the British Foreign Office.

A translation of the full text of the draft pact follows:

The Governments of: the Hashemite Kingdom of Jordan, the Republic of Sudan, the Republic of Iraq, the Kingdom of Saudi Arabia, the United Arab Republic, the United Kingdom of Libya, the Mutwakilite Kingdom of Yemen, the Kingdom of Morocco, the Emirate of Qatar, the Emirate of Kuwait, being desirous of cementing economic cooperation between them, and coordinating their oil policies, have agreed upon the following:

Art. I: The governments which are parties to this agreement shall endeavor to issue a standard petroleum law embodying the basic principles for regulating the relations of governments with concessionaire companies in respect of financial, technical, social, health, and labor affairs, and embodying the terms under which new concessions are to be granted.

Art. II: The governments which are parties to this agreement agree to an exchange among them of all useful statistics, data, and documents relating to oil and the exchange of experts and technicians.

They also agree to unify accounting methods relating to the petroleum industry.

Art. III: The governments of the oil-producing countries which are parties to this agreement agree to adopt proper practices for conserving their oil reserves and for maintaining oil prices, and agree to coordinate their oil policies.

They see no objection to cooperating with other oil-producing countries whose circumstances are similar to theirs, such as Iran or Venezuela, in the light of their common interests and world market considerations.

Art. IV: The governments which are parties to this agreement agree to cooperate with each other in an effort to improve the terms of present-day concessions, after holding joint consultations to this end.

Art. V: When new petroleum concessions are to be granted by the Arab states, first preference shall be given to wholly-owned Arab companies, and second preference to Arab companies with foreign capital participation.

—If the terms offered by such firms are no less favorable than those that might be offered by foreign firms;

—And provided that such firms should have the necessary capital and technical experience.

Art. VI: The governments which are parties to this agreement undertake to prevent the passage of Arab oil in pipelines across non-Arab territory, and to non-Arab terminals.

Art. VII: The governments signatory to this agreement agree to oblige the oil companies to employ the nationals of the host governments in the companies' various operations subject to the following proportions:

Nationals of the host country must constitute no less than 90% of the labor force and 70% of the administrative staff of the company.

If the supply of trained local employes and workers in the host country is inadequate, the companies must be obliged, pending the training of local employes and workers, to give first preference to nationals of the other Arab states, and second preference to nationals of friendly states.

In the meantime, the companies should train sufficient numbers of the nationals of the host countries, according to training programs laid down by the signatory governments, to take over the majority of company jobs within a reasonable period.

Art. VIII: The governments which are parties to this agreement shall endeavor to request existing and future concessionaire companies to appoint nationals of these governments as executive members of their boards of directors, and shall endeavor to increase their participation in the taking of decisions relating to the companies' operations, and supervision of such operations.

Art. IX: The governments which are parties to this agreement agree

Oil Companies Agree to Aid Venezuela

CARACAS—Oil companies have agreed to a Venezuelan request for $100-million to bolster its dwindling gold and dollar reserves, which have dropped to about $700-million, from a peak of $1.3-billion two years ago.

Actually, the deal will not be a direct advance on their tax payments due in April, as suggested originally. Instead, the oil companies have agreed to guarantee the purchase by U.S. banks of Venezuelan Government treasury bills.

The government has also asked the companies for further $100-million assistance in December and January, but the companies so far have made no commitment on this.

This year, oil companies paid nearly $1-billion in taxes and royalties on 1958 operations, following the retroactive income tax hike last December.

to the establishment of an institute of advanced petroleum studies, which shall be attached to the Arab League and provide training in petroleum economics, engineering, and law.

Art. X: The Arab oil-producing countries shall endeavor by all possible means to supply any Arab state with its domestic oil requirements.

Art. XI: The governments which are parties to this agreement agree to endeavor to oblige the companies operating in their territories to refrain from altering posted prices without the prior approval of the governments concerned. The governments shall consult with each other to adopt a unified attitude when the oil companies give notification of their intention to effect such alterations.

Art. XII: The governments which are parties to this agreement agree to request both present and future concessionaires to surrender portions of their concessions which they have failed to develop and for which no rent is paid.

Many 'Extras' Bid for Spain's Sahara

MADRID—Spain is weighing a wide assortment of "extras" offered —over and above terms of its new 50-50 oil law—in the recent stiff new competitive bidding for heavily overlapped Spanish Sahara oil rights.

The added inducements are included in detailed new bids recently opened in Madrid and due for official publication shortly. It is now estimated that it may take the government until early January to complete its rating of the many intangibles involved, and to make the Sahara awards. Mainland Spain grants are expected sooner.

The new Sahara bids were filed by all 20 groups of original bidders—plus one completely new bidder, Sohio—who were given the chance to improve on or add to the earlier offers (PW—Sep.11'59,p46). As a result, the total was boosted to 176 bids on 37 blocks.

There are now 19 U. S. firms represented, three of which came in for the first time, but as partners with the Spanish government's Instituto Nacional de Industria. They are: Signal Oil & Gas Co., Carl M. Loeb, Rhoades & Co. (New York investment firm), and General American Oil Co. of Texas.

Here are some highlights of the added inducements offered in the new bids:

• **Standard Oil of Ohio, the one new bidder, offered 20% state participation, and a bonus** tied to block 52, one of five tracts it wants. The bonus is $300,000 for 52 if it also gets one more block, $500,000 with two more, and $1½-million with three more.

• **Phillips offered a $2½-million polyethenene patent in an "all or nothing" package bid** for Sahara and mainland Spain acreage. It will withdraw its bid for three Sahara blocks if not awarded 13 permits it requested in Spain itself.

• **Union Oil of California made a many-faceted bid that includes private Spanish capital participation in development;** a 16.6% royalty; drilling in 180 days; no transfer of hard currency out of Spain for five years; and possible joint operations with INI.

The Spanish participant, Cia Iberica de Petroleos, would have a 30% interest but would put up only 20% of development costs.

• **Superior offered bonuses for six of a total 19 tracts,** including $100,000 for two tracts (19 and 20) on which no previous bids had been filed.

• **Atlantic made three types of bonus offers on four blocks** of the 16 in its bid—all three types for blocks 43 and 47: $250,000 on award, plus a like amount on renewal, plus $650,000 for each development concession when production reaches 1,500 cu. meters daily for 20 days.

• **Tidewater offered a 20% royalty, and a qualified bonus,** with Sohio and a Spanish bank associated in its bid for 16 blocks.

It offered $250,000 for block 1 if it is also awarded one further block, $400,000 if two more, and $2.1-million if three more.

• **Ohio Oil bid on six more blocks in addition to its original two, and offered a $2½-million bonus for each development concession.** It also offered to drill at least one test each year on the six added blocks (2, 9, 16, 23, 41, and 45).

• **The Caltex companies offered 40% Spanish capital participation** in 16 blocks, plus $2½-million in bonuses for five of them. Also: a mainland exploration contract with Campsa, the government marketing monopoly.

• **Sinclair offered a 15% royalty and reinvestment in Spain of 10% of profits** if production is established. These terms apply to four of the five blocks in its bid.

• **Continental offered a $2½-million bonus for each development concession** on the eight blocks it bid for. It offered to start drilling one test within 18 months.

• **Sun Oil, with Champlin Oil & Refining, offered 25% participation to Iberica, a private Spanish company** that would not be required to make any expenditures for two years. This applies to four of the six blocks bid for.

• **Cities Service and Richfield offered to finance 85% of expenditures, with the government-owned Campsa participating 30%** in the benefits on eight blocks. Drilling would start in the first year.

• **Gulf Oil and Cepsa, a private Spanish oil company, offered joint exploration** under their separate bids for a total of 27 blocks. They offered advance payment of $1.2-million in increased rentals for 12 specified blocks; $12-million exploration investment in the initial six years; and drilling in the first year.

Gulf would finance the hard-currency expenses. And Cepsa would make available to the government $500,000 for each of the 12 blocks granted, for oil purchases from Cepsa's Tenerife refinery in the Canary Islands.

• **Pan American International and the government's INI will have a 50-50 deal** on eight blocks for which they had filed a joint bid.

• **General American Oil Co. of Texas will finance 75% of costs** and INI 25% under an exploration agreement on four blocks for which INI initially applied (17, 39, 44, 51).

• **Signal Oil & Gas and Carl M. Loeb, Rhoades & Co. jointly will finance exploration in return for a 50% interest** in another four blocks which INI had also applied for (23, 24, 31, 32). If production is established, INI will bear 50% of development costs and the two U. S. firms 25% each. Signal will be the operator.

• **The French-owned SAEEP offered Spanish participation in 976,000 hectares of French Sahara oil rights** in its joint bid with INI for eight Spanish blocks (PW—Oct.9'59, p92).

What's New / AROUND THE WORLD

Esso, Caltex Add Two Libya Oil Finds

LIBYA—Esso and Caltex have brought in two new central Libya oil wells. Esso's No. 3 Zelten, 100 mi. from the coast, which failed to produce from the horizon found in the first two wells, had a sizable flow of oil with 30% water from a limestone below 7,600 ft., about 2,200 ft. lower than the earlier Zelten pay. Caltex's No. 2 Beda, 30 mi. southwest of the Zelten finds, is a 5 mi. northward extension of the Beda discovery. The well, which will not be potentialed until it is acidized, found a lime pay at about 4,050 ft.

•

GUATEMALA—Lummus Co. will start work in early January on Central America's first refinery—a 3,500 b/d plant near Puerto Barrios (PW—Oct.3'58,p72).

It will be owned jointly by Shell and Breaux Bridge Refining Co., of Louisiana, through their newly formed Matias de Galvez, Ltd., named for the small Caribbean port where the plant will actually be located.

•

IRAN—Italy's Agip is now drilling its first onshore Iranian wildcat atop an 8,200-ft. mountain, 160 mi. southwest of Isfahan. It is using an Italian-built Ideco Super 7-11 rig on Mt. Seguta, in the Zagros region. Meanwhile, its first Iranian wildcat, spudded Aug. 31 in the Persian Gulf, is being drilled below 3,900 ft.

•

ALGERIA—The stage is set for another major 24-in. Sahara pipeline to the Mediterranean—this one for gas. SN Repal, French operator of the Hassi R'Mel gas field, has awarded a contract for the first 200 mi. of a line that will eventually run 327 mi. to the coast.

•

FRANCE—The nearness of Sahara crude has prompted cancellation of at least one giant supertanker, on order. British Petroleum's French transport affiliate gave that reason for outright cancellation of a 68,500-ton tanker, after first revising the order to 48,000 tons.

•

VENEZUELA—Domestic gasoline consumption increased 9% over a year ago in the first nine months of 1959, to a total of 928,630 bbl.

•

ITALY—The U.S. and Italian partners in Stanic have agreed to equal use of the company's 90,000 b/d refining capacity.

Under the 1949 pact that has now been revised, Jersey Standard had the right to use 70%, and the state-owned ENI's ANIC 30%, of the capacity of the Bari and Leghorn refineries, which the two own on a 50-50 basis.

•

NIGERIA—Shell-BP of Nigeria expects it will take another ten years before it can break even on its oil operations.

It has spent $168-million on exploration so far, $50-million of it in 1959. It expects oil output to climb to 30,000-40,000 b/d by mid-1960, when new terminal facilities will be in operation.

The company estimates that it will be 1964 before annual income equals expenditures. It hopes to have wiped out its accumulated deficit by the early 1970s.

•

VENEZUELA—Sun Oil, "newcomer" to Venezuela, jumped into fifth place among the country's producers in October. The month's output totaled 2.7-million b/d, with company averages as follows (in 000 b/d):

Creole 1,044.3; Shell 767.1; Mene Grande 382.5; Mobil 117.4; Sun 71.6 (up 21.3 from September); Richmond 58; Texaco 54.9; Phillips 54.6; Sinclair 45.5; San Jacinto 41.8; Mercedes 30.8; Atlantic 26.1; Signal 23.7; Colon 19.7; Superior 7.3; and Talon 1.2.

•

SPANISH GUINEA—Gulf Oil and a Spanish partner, sole bidders for Spanish Guinea oil rights, were awarded acreage there last week as the first grant under Spain's new 50-50 oil law. Gulf and Cepsa, an integrated private Spanish oil company, had made a joint bid for 288,000 acres with an $11.8-million eight-year exploration program.

•

Refinery Anyone?

PORTUGAL—Anyone looking for an unusual refinery site? Portugal would like to see a refinery built on its Cape Verde Islands, some 500 mi. out in the Atlantic Ocean west of the African bulge.

Wildcats in the News

VENEZUELA—Sinclair brought in it's No. 2 East Aguasay last week, a 3-mi. extension to the expanding Aguasay trend in eastern Venezuela. The wildcat was dually completed at the rate of 1,352 b/d of 32.2-gravity oil, from 14,183 ft. and 14,264 ft.

NIGERIA—Mobil Oil last week spudded its first Nigerian test on a 2½-million-acre block in the southwest. The site is 30 mi. west of Lagos, and almost 200 mi. from the nearest discovery.

TURKEY—Bolsa Chica Oil, a U.S. independent, has suspended operations in southeast Turkey. It has just abandoned No. 1 Silvan at 6,138 ft. as the fourth dry hole drilled on a 370,000-acre block.

IRAN—The Consortium's first coastal wildcat flowed oil at an estimated 4,000 to 6,000 b/d from an undisclosed pay at about 8,000 ft. The No. 1 Binak, northwest of Ganaveh, was bottomed at 10,822 ft.

LIBYA—Oasis Oil, operator for the Conorada group, will drill a test offsetting Caltex's Beda discovery, in central Libya. The wildcat is spotted 5½ mi. south of Beda, in block 59.

BURMA—Burma Oil will drill its seventh wildcat since 1957 on the Irrawaddy delta, near Pogaung village. The company's sixth test, drilled at Payagon, was abandoned last month at 13,108 ft., the deepest ever drilled in Burma.

Computer Monitors Reformer Economy

Use of an electronic computer to optimize operation of a cat reforming unit has resulted in a saving of over $100 a day at the Ohio Oil Co.'s Robinson (Ill.) refinery.

This refinery processes approximately 45,000 b/d of 37-gravity Illinois low-sulfur crude.

It produces regular and premium gasolines, some aviation gasoline, No. 1 and No. 2 heating oils, diesel fuel, and petroleum coke.

The plant consists of a crude still with atmospheric and vacuum distillation sections, a fluid cat cracker, a cat reformer, a sulfuric acid alkylation unit, a polymerization unit, and a delayed coker.

Preliminary mathematical analyses at its Denver research center had convinced the company that, of all refinery processes, the cat reforming unit was the easiest to tie down to computer optimation.

Of the six refinery processes used at Robinson, cat cracking and cat reforming were singled out as the most fruitful fields for an optimation program.

Cat cracking proved difficult, however, because a change in any one of the operating variables redefines the entire cat cracking process. Cat reforming conditions, on the other hand, are easy to modify, simply by changing the rate of raw feed or the temperature.

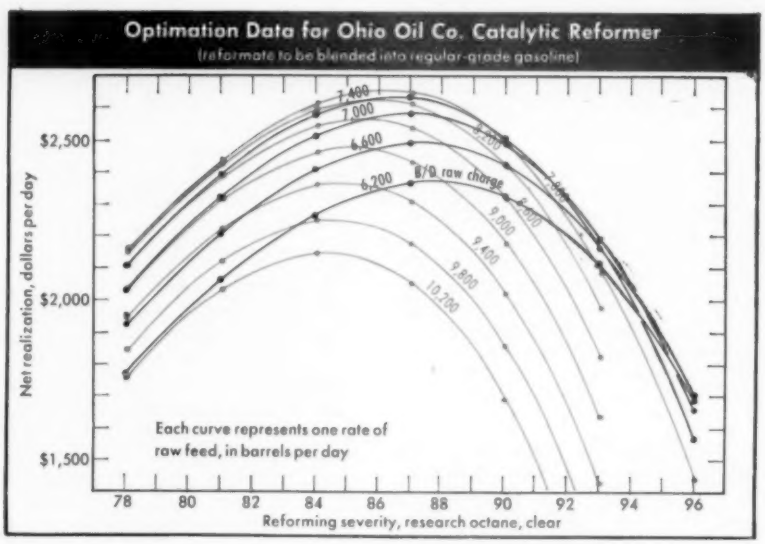
The purpose of the optimation program was to determine the feed rate to the cat reformer, and the severity, that would give the maximum net realization in dollars per day.

The finished gasoline consists of the reformate from the cat reforming unit, some light straight-run gasoline, some light cat cracked gasoline and alkylate for the premium fuel, some butane to obtain the specified Reid vapor pressure, and TEL.

The company decided that, for the time being at least, set conditions would be assumed for the cat cracking unit, and the computer would be used to determine (1) the reforming severity level, and (2) the rate of charge to the cat reformer, that would yield the highest financial realization.

The severity level was measured in terms of clear research octane rating, and the machine was set to take into account the amount of tetraethyl lead required to raise the rating from that level to the number required for blending into regular and premium motor fuels. Feed rates considered ranged from 6,200 to 10,200 b/d.

CAT REFORMING UNIT at Ohio Oil Co.'s Robinson (Ill.) refinery (above) is monitored with an electronic computer for highest over-all economy. Computer calculates data for family of curves (below) showing net realization for various feed rates and reformer severity. The highest result—in this case 7,800 b/d and 86 research octane number—is selected, and unit adjusted to run at those levels.



Altogether, 17 variables were fed into the computer:

(1) Barrels of crude processed per day in the refinery.

(2) Fraction of full-cut straight-run gasoline obtainable (about 30% with a 400F end-point).

(3) Barrels of raw charge going into the making of premium gasoline. This data is obtained from a parallel program applied to premium gasoline.

(4) Minimum cat reformer charge.

(5) Maximum cat reformer charge.

(6) Increment in raw charge, for each successive feed rate considered.

(7) Minimum reformer severity.

(8) Maximum reformer severity.

(9) Increment in severity, for each

The 5-foot bubble . . .

Weird things can happen when pilot plant data are scaled up to a full-sized petroleum processing unit. Well-nigh unmeasurable and apparently harmless effects in the pilot plant can attain major proportions in full-scale production.

A harmless 2-inch vapor bubble in a pilot plant, for example, may correspond to a 5-foot bubble in the commercial unit. Such things must be prevented!

Applying over four decades of "scaling up know-how," Universal engineers design plants that achieve the same results with tens of thousands of barrels of feed stock as those developed in pilot plant studies involving less than a barrel.

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successive step of the study (selected as 2, from 78 to 96).

(10) Reid vapor pressure specified.

(11) Research octane number specified, for regular motor fuel.

(12) Barrels of butane available for blending.

(13) Value of butane per barrel.

(14) Value of C_4 products used as feed for polymerization unit.

(15) Value of finished gasoline.

(16) Value of fuel gas produced.

(17) Cost of TEL in a barrel of finished regular gasoline.

The successive steps of computer calculations follow a logical sequence, and all the data necessary for optimizing the cat reforming operation are supplied by the machine.

These include:

- Barrels of light straight-run gasoline that should go in the blend, and each of its characteristics.
- Barrels of actual raw charge, after cutting off some very light and very heavy objectionable fractions.
- Characteristics of the reformate that will be made, before and after addition of butane.
- Quantity of TEL required for the blend.
- Cost of operation, for each case.

The computer automatically repeats the operation for each level of severity at each rate of feed.

When the data pertaining to the highest rate of raw charge and the highest level of severity have been typed out, the computer stops.

This data can be plotted as a family of curves, one for each feed rate, showing reforming severity plotted against net realization (chart, page 38).

Each of these curves shows a maximum financial realization for one severity. The best of all these maximums is selected, and process conditions are adjusted accordingly.

The machine used for this work is a G-15D Bendix digital computer, with magnetic tape storage, a photoelectric paper tape reader, and an input-output typewriter.

This equipment is rented by Ohio Oil at a monthly rate of $1,760.

Interpretative coding systems are used for the cat reformer program instead of "computer machine language." This means that the machine must first translate the orders it receives into computer language, and, likewise, translate the answers into readable, intelligible language, before typing out the data sheets.

The extra time this requires is not objectionable, the company says, since the machine does its work unattended.

An optimation checkup of cat reforming conditions has become a monthly routine at the Robinson refinery. It is also done at closer intervals whenever one of the variables—nature of the crude, vapor pressure, or octane requirement—undergoes a noticeable change.

"In addition to this regular routine, which has greatly improved our cat reforming operations," says John W. Russell, who is in charge of the computer project at Robinson, "we are at present carrying out a more sophisticated study of our cat cracking operations. We are confident that, once completed, this will result in an even greater saving than did our cat reforming program.

"The final word, of course, will be said when the results of optimation of each individual process can be integrated for the entire refinery. This is still a long time off.

Ohio Oil does not plan to adapt the electronic computer to actual operation control for any of its processes in the foreseeable future. Russell explains that this could not be economically justified.

"There is too great a gap," he says, "between the enormous potential of a computer, and the small effort needed to operate a process normally designed for manual control, to justify the expense. Little could be gained."

Ohio Oil expects to expand its use of computers considerably.

"We are planning an extensive computer program, with larger computers," M. W. Nicholas, staff manager of Ohio Oil, told PETROLEUM WEEK. "We hope to cover the operations of our three refineries—Robinson, Detroit, and Muskegon—and all our outlets, so as to integrate every detail towards maximum financial realization."

Cyclic Acids Dry Paint Faster

Certain cyclic aromatic acids, when added to alkyd resin paints and coatings, change the character of these alkyds so fully and rapidly that drying occurs within a few minutes of their application, at room temperature.

Working on a project for a major oil company, David Berry, of Battelle Memorial Institute, Columbus, Ohio, tried several types of chemical substitutions in the elements of the coatings, before hitting on this fast curing process.

Alkyd resin paints, conventionally, consist of a pigment, plus a mixture of three other elements: (1) Phthalic anhydride, or another dicarboxylic aromatic acid; (2) Glycerine, or some other polyol; (3) Linseed or soya oil, or another fatty ester or acid.

One or more of these three elements must be modified in order to accomplish the drying.

The method which Battelle is exploring consists in the substitution of a monocyclic or dicyclic aromatic acid for part of the fatty acid.

Various acids have been tried. The best, so far, were found to be the dicyclic aromatics, particularly naphthoic acid, followed as a close second by 2,4-dimethylbenzoic acid.

Small differences in the configuration have proved to be significant in the effectiveness of the modifier. Thus the 2,4-isomer dimethylbenzoic acid is far superior to the 2,5-isomer.

An important result of this treatment is that the coating, once cured, is no longer soluble in most chemical solvents. The treatment turns it into a resistant enamel, which must be saponified with a strong lye before it can be removed from the surface on which it has been applied.

Gulf Boosts Tonnage Of Oxo Alcohols

Gulf Oil Corp. is building a $10-million plant for the manufacture of high-molecular-weight alcohols by the Oxo process, on a 100-acre tract across the Schuylkill river from its Philadelphia refinery.

The project was engineered and will be built by Badger Mfg. Co.

"This plant is larger than the Oxo plant which Gulf has had in operation at Port Arthur," Robert L. Grun, of Gulf's Petrochemical division told PETROLEUM WEEK, "and will benefit from the vast experience gathered during these past ten years. It will be substantially different from our first Oxo plant" (PW—May22'59,p28).

The product that will be produced in largest quantity will be octyl alcohol, using high molecular-weight olefins as raw material. "Of course," Grun adds, "these alcohols are always obtained as mixtures: about 15 isomers of octyl alcohols, of which four are predominant, will constitute our commercial iso-octyl alcohol."

These alcohols are used primarily as plasticizers for the manufacture of vinyl plastics.

What's New / IN PROCESSING

Production of synthetic rubber will more than double in the next ten years, while natural rubber production will stay at current levels, according to George R. Vila, vice-president of U.S. Rubber Co.

Addressing the annual meeting of the Rubber Manufacturers Assn. in New York last week, Vila predicted that world-wide rubber consumption will hit 7-million long tons by 1970. More than 60% of the total consumption will be synthetic rubber, he noted.

•

Unicracking, a new process developed by Union Oil Co. of California for upgrading distillates, has completed its pilot-plant stage, and is now ready for commercial application, according to Fred Hartley, Union's vice-president of research. The heart of the process is a new catalyst which, says Hartley, is both long-life—several months of continuous operation—and quickly regenerable.

•

A new phenol unit is on stream at Shell Chemical Corp.'s Houston (Tex.) plant. Output will be used primarily for the manufacture of Bisphenol-A, a principal ingredient in the company's EPON resins.

•

Dixon Chemical Industries' $5-million sulfuric acid plant went on stream last week at Paulsboro, N.J.

Acid-bearing sludge from oil refining processes will be used to produce 300,000 tons of sulfuric acid annually.

Output will serve refineries and other industrial users in the Delaware Valley.

•

A $4-million natural gasoline plant will be built by Union Oil Co. of California and Goliad Corp., of Houston, in Vermillion Parish, La.

Fluor Corp. is contractor for engineering and building the 450-million cf/d facilities, which include absorption, distillation, glycol, and sponge oil units.

•

Michigan's first petrochemical complex—Dow Chemical Co.'s Saginaw Bay Division—is now in operation.

The new division includes a plant to make ethylene and butadiene, and a polymer plant to produce polyethylene and polypropylene.

Bay Refining Co., acquired by Dow in 1956, will supply the petroleum-based raw materials for the operations.

•

A multimillion-dollar crude processing, gas treating, and sulfur recovery plant will be built in Innisfail field, Central Alberta. All companies in the field will share construction costs, on the basis of their holdings.

Canadian Oil Cos., Ltd., the operator, says 7,500 b/d of crude will be processed and delivered to existing pipeline systems. After sour solution gas is treated, 8.7-million cf/d of dry, sweet gas will be delivered to the Alberta Gas Trunk Line.

In addition, 160 bbl. of natural gas liquids and 80 long tons of sulfur will be produced daily.

On-stream date is set for Nov. 1, 1960.

•

Ohio Oil Co. has announced plans to build a 25-million cf/d natural gas processing plant in Hillsdale County, Mich. The plant, to be completed by mid-1960, will use refrigeration processes to extract butane and natural gas mixtures from wet casinghead gas.

•

Canadian Oil Cos., Ltd., has just completed an $8-million expansion of its Sarnia (Ont.) refinery. Construction of a 20,000 b/d crude unit boosts capacity to 50,000 b/d. A Unifiner also was added, and Platformer capacity was doubled.

•

Continental Oil Co. will build a customer service laboratory at Englewood, N. J., to take care of petrochemical service formerly handled at Chestertown, Md., and Ponca, City, Okla.

•

Correction

The 305-ton-per-day ammonia plant of Petroleum Chemicals, Inc., at Lake Charles, La., (PW—Nov.13'59, p.94) was designed and constructed by Foster Wheeler Corp.

"give me

ONE

good reason"

That's what the man said, "Give me one good reason for buying a Platinum Reforming Catalyst from you. One brand's pretty much like another." And so it would seem on the surface. We could argue with conviction that Houdry 3-G often produces very high octane reformates at a lower cost and that the rate of catalyst deactivation between regenerations is very low. But even if Houdry 3-G were exactly like all others, there is one important reason why Houdry should be your source of supply:

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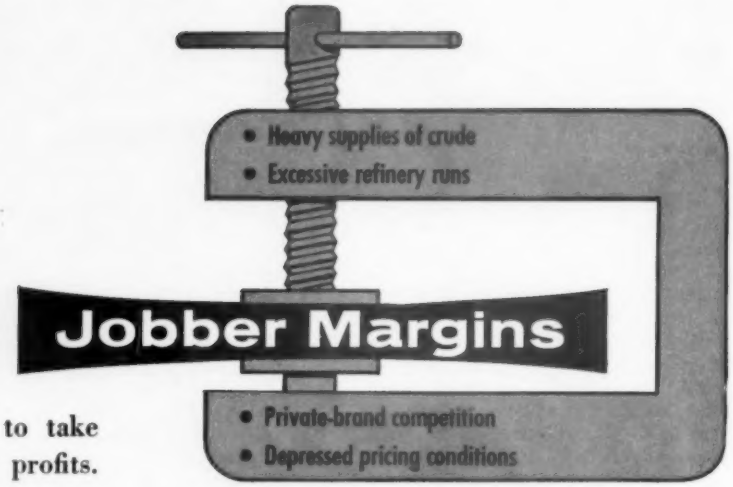

What Is the Outlook for Jobber Margins

Oil jobbers are studying ways to take some of the squeeze off their profits.

Oil jobbers are growing increasingly concerned these days over the continuing squeeze on their margins.

This old source of irritation has moved many of them to re-evaluate their position in the oil industry and to take some new steps toward improving their own outlook.

The reason for this renewed activity is the continued pressure on margins (1) from above, through oversupply and increased refinery runs, and (2) from below, in the form of depressed prices and increased competition from private-brand marketers.

The concern of the jobbers is seemingly supported by the sentiments of many suppliers, who say the outlook for jobber margins is not bright.

Few suppliers expect jobber margins to widen in the future. Indeed, pressure on their own margins has caused them to make increasing efforts to improve their own operations.

Privately, many suppliers admit that, instead of broadening, jobber margins will continue to decline. They point to the expansion of private-branders as "proof that major-brand jobbers have been enjoying margins that have been too large."

To improve their competitive outlook, however, jobbers are considering seeking adjustments that will at least give their margins a more realistic character.

The need for such readjustments is emphasized in many areas by the protracted periods of "temporary" pricing conditions—some of which have lasted for years—that have forced jobbers to accept narrower margins.

These narrower margins often result from sliding-scale contracts, which require the jobber to absorb some (up to 30%) of the declines in retail prices when price disturbances occur.

The problem, jobbers feel, is that the sliding scale got stuck at its lowest stop.

Two possible solutions have been suggested: more flexible tankwagon postings, and a change in the sliding-scale formula contained in jobber contracts.

These recommendations were made before the National Oil Jobbers Council earlier this month by Joseph D. Hadley, executive secretary of the Michigan Petroleum Assn.

Hadley suggested that "tankwagon postings be made more flexible so that their appearance will show a realistic 'normal' price in conformity with economics; or, in the absence thereof, that the sliding-scale formula be amended so that jobbers' margins are not reduced until a temporary posting falls more than, say, 2¢ a gal. below 'normal.'"

NOJC assigned to committee the task of studying Hadley's recommendations.

Some jobbers believe that their competitive position could be improved if tankwagon prices were eliminated entirely. Everybody would then buy at spot or terminal prices.

Increased competition from private-branders, who pay lower prices than major brand jobbers do, is the main reason behind this thinking.

"Just how much value does a brand have for a jobber?" asks a jobber from North Carolina who is a prominent proponent of the elimination of tankwagon prices.

This jobber and many others from all parts of the country find little justification for the higher prices they must pay for product when they have obligated themselves to be the steady customers of their suppliers.

The once-cherished advantage of selling a branded product has been lessened by the growing prestige of the private-brander, many jobbers believe.

If both major-brand jobber and private-brand jobber could purchase their product at the same price, these jobbers feel, the position of the major-brand jobber would be improved.

Other jobbers seek a modification of tankwagon pricing arrangements that would permit them to compete for excess product whenever it becomes available.

At present, the branded jobber is more or less tied to his own supplier for product. If he goes to another supplier to buy, he is either refused or he runs the risk of losing his contract, jobbers say.

The loss of a contract would represent a serious set-back to many a jobber who has spent years building up his suppliers' brand and developing his territory. Consequently, jobbers feel that they are effectively cut-off from sources of supply outside of their own suppliers' normal tankwagon deliveries.

Myles Hall, a Minnesota jobber who is particularly disturbed by this situation, would like his contract to state explicitly that he be able to purchase excess products when they become available, not only from other suppliers, but from his own as well.

There is no reason, Hall believes, why suppliers should turn to commercial accounts, for example, to unload excess product, when jobbers like himself would very much like to purchase the product at the low prices at which it is usually offered.

NOJC appointed Hall chairman of a subcommittee to study the feasibility of introducing such modifications into jobber contracts.

Most of these proposals to improve margin conditions for branded jobbers would tend to undermine the

competitive position of private-brand marketers.

If branded jobbers were permitted to purchase their product at spot or terminal prices—alongside their private-brand competitors—the latter's initial cost advantage would disappear. Furthermore, if all branded jobbers were able to buy excess product freely, the private-brander could lose at least some of his cheap source of supply.

Although the pressure on the private-brander may not take either of these forms, the restlessness among branded jobbers hints at possible marketing changes that could alter the present set-up of distribution.

Many executives in large supplying companies agree that the historic basis on which prices and margins are pegged could be made more realistic. "It becomes increasingly important," says a marketing vice-president of a large eastern supplier, "that we protect our business by narrowing or eliminating the so-called 2¢ major-independent price differential."

Understandably, private-brand marketers are making a concerted effort to maintain the historic differentials in prices.

The Society of Independent Gasoline Marketers of America, earlier this month, put forth several arguments for the retention of "a proper differential" between the independent marketer and the integrated company.

SIGMA's president, Phil L. Siteman, emphasized that heavy advertising budgets and credit cards tend to give the integrated company greater marketing strength than the independent possesses.

Siteman also pointed to the large number of stations and the ability to "subsidize their jobbers and dealers during price wars" that are available to the integrated companies.

Since these factors give the integrated supplier a competitive advantage over the private-brander, they must be compensated for by at least a 2¢ differential between the independent and the integrated marketer, Siteman said.

Many jobbers expect eventual government intervention in marketing to save the oil jobber from extinction.

Few jobbers enjoy the thought of having to operate under governmental decree. And most of them are opposed to any government action that would result in a decrease in percentage depletion or a divorcement of marketing from suppliers.

Nevertheless, many jobbers feel that excessive refinery runs and prolonged price wars will bring some form of government control to oil marketing.

The resolutions approved by the National Oil Jobbers Council at its fall meeting could turn out to be a step in this direction.

The jobbers resolved to "ask the Federal Trade Commission for a study of marketing profits of integrated oil companies" and also to "seek action, either through the Congress of appropriate regulatory bodies" to reduce refinery runs (PW—Nov.13'59,p21).

Both of these resolutions are contingent upon a failure of suppliers to take steps on their own toward these ends within 90 days.

What's New / IN MARKETING

Fair Trade Crippled In North Carolina

Esso Standard Oil Co. has dropped fair trade in North Carolina—after less than six months of fair-trading there, and other companies are expected to follow.

A spokesman for Gulf Oil Corp., for example, told PETROLEUM WEEK last week that, "We would be forced to give up fair trade if other companies dropped it."

The immediate provocation for Esso's move was a sudden flareup of the price war that has centered in Charlotte.

But there are other factors that tend to make fair trade unworkable in North Carolina:

- If they lower their prices anywhere in the state, fair-trading companies are required by law to lower them throughout the state. This has caused the Charlotte war to spread to other towns.
- Fair trade has received a great deal of criticism from state attorney general Malcolm B. Seawell, who threatens to bring court action against fair trading companies (PW—Nov.6 '59,p126).

Seawell announced this week that he will continue to campaign until all major companies have dropped fair trade in North Carolina. Seawell plans no action against Esso.

•

Which are the most important subjects for dealer training? Chassis lubrication and automatic transmission service, according to the results of the fifth annual survey of service station training needs by Hoods Up, a monthly service station training bulletin distributed by several major suppliers.

"With falling motor oil ratios, chassis lubricants have become increasingly important as a source of petroleum revenue," was one of the typical comments made by the more than 1,700 marketing executives questioned by the editors.

Automatic transmission servicing was considered important because "in the past seven years, the number of automatic transmissions have increased from 28% to just over 60%" of all automobiles.

The three other most important subjects for dealer training were found to be selling on the driveway, information on motor oils and additives, and an understanding of modern high-octane gasolines.

•

Most foreign-car owners purchase regular gasoline for their cars. That's one finding of Ethyl Corp.'s recent study of European cars.

This is particularly true of the economy-type cars, where 83% of the owners use regular. In the higher-priced sports-car category, only 27% of the owners use regular.

As for fuel economy, the most frequently reported result was that foreign cars get 31 to 35 mi. per gal. But owners of higher-priced types reported that they get between 21 and 25 mpg.

Only 5% of the respondents found this fuel economy "unsatisfactory."

•

Fair trade laws do not prohibit state governments from buying cut-rate gasoline when state laws specifically permit government agencies to seek volume discounts.

This is the view of Utah's attorney general, Walter L. Budge. His remarks were directed toward Trade Commissioner Parley W. Hale, who insisted that government purchase of gasoline at prices lower than that motorists must pay is a violation of Utah's fair trade law.

HERBERT S. JOHNSON, JR., is the new vice-president of marketing for Nalco Chemical Co., Chicago. He will coordinate and assist in the sales operations of various Nalco divisions, and will work on advertising, marketing research, pricing studies, and long-range planning for the company. **Leonard R. Robinson, Jr.**, replaces Johnson as manager of the industrial division. Robinson was formerly field personnel manager.

H. S. Johnson, Jr.

F. M. Wood

FENTON M. WOOD moves up to vice-president in charge of research and development for Tuboscope Co., with headquarters in Houston. He was formerly chief design engineer for the company. In his new position, he will direct a development program designed to create new tools and products.

EMIL PFISTER has joined Universal Oil Products Co., Des Plaines, Ill., as a consultant. He began his career in petroleum refining in 1920 at the Royal Dutch Shell laboratories in Amsterdam. After that, he served as manager of the Royal Dutch group of refineries in various parts of the world. Following World War II, and until his retirement, he was in charge of technological matters connected with refining and petrochemicals for Asiatic Petroleum Co., in New York.

JAMES B. LONERGAN has been appointed advertising manager of Ethyl Corp., New York. He has been associated with Ethyl since 1943, and has been a member of its advertising staff since 1951. Lonergan, who will be responsible for all advertising, will serve on the staff of **Russell B. Weston**, director of advertising, sales promotion, and merchandise management.

ALLEN P. COLBY, advertising manager of National Supply Co., Pittsburgh, will retire Dec. 1. Colby, who has been with National Supply for the past 38 years, was named advertising manager in 1943.

G. R. CAIN, salesman for Jones & Laughlin Supply Division at Kermit, Tex., has been transferred to Borger, Tex., in the same position. Cain joined J&L as a storeman at the Newcastle (Wyo.) store in 1954. He also served in similar capacities at Casper, Wyo., and Hobbs, N.M. He was promoted to salesman and assigned to Kermit in 1958.

G. R. Cain

J. W. Lowrance, Jr.

J. W. LOWRANCE, JR., is the new production valve salesman representative in the Rocky Mountain region for Grove Valve & Regulator Co., with headquarters in Farmington, N.M. He will serve Grove customers in the Rocky Mountains and in the Four Corners region. He was formerly owner and manager of Lowrance Specialty & Service Co., which was engaged in the sales and service of oil field equipment.

CHARLES J. SPIKER is the new manager of oil field accounting for National Supply Co. in Pittsburgh. Spiker, with the company since 1942, was assistant division controller of the California division for three years. He became assistant general auditor for the company in 1954, and was appointed controller of the Toledo plant in 1957.

C. JIM STEWART & STEVENSON, INC., Houston, assumes exclusive dealership of industrial trucks manufactured by Hyster Co., in the South Texas area. Hyster industrial truck products, including lift trucks, straddle carriers, and mobile yard cranes, will be handled by Stewart & Stevenson's truck lease division. **William Herring**, sales manager of the division, and **George Felts**, operations manager, will be in charge of Hyster sales.

DON L. HENRY is the district salesman at Parkersburg Rig & Reel Co.'s new district office at Pampa, Tex. He has been with Parkersburg since 1953.

D. L. Henry

B. Anderson

BEN ANDERSON has been appointed manager of the West Texas division for Milwhite Mud Sales Co., with headquarters in Midland. Since he joined Milwhite in 1956, Anderson has been located at Casper, Wyo., and Ft. Worth. He has also served as an engineer, district superintendent, and regional manager of production for Continental Oil Co., and as manager of drilling and production for Oceanic Oil Co. **James N. Statton**, formerly salesman for Milwhite in New Orleans, transfers to Midland in the same position. Statton, who joined the company in 1952, was a field engineer in South Texas before he shifted to the sales staff. **George W. (Bill) Bowman** and **Jack Nini** have joined the Milwhite sales staff. Bowman is the new sales representative in Ft. Worth, and Nini is a member of the staff in Midland. Bowman was most recently a distributor of drilling muds, and before that was associated with Reed Roller Bit Co. Nini has been in the securities business in Texas.

FRED NUSSBAUMER, assistant division manager for the Appalachian area of Halliburton Oil Well Cementing Co.'s Evansville division, is head of the company's new Pittsburgh office. He will be in charge of Halliburton's operations in Pennsylvania, Ohio, West Virginia, and eastern Kentucky. Nussbaumer, with Halliburton since 1940, was named assistant division manager and division engineer at Evansville in 1956. **William W. Ball**, formerly assistant division engineer at Evansville, succeeds Nussbaumer as division engineer.

JOHN S. CARLSON has been appointed sales vice-president of Shippers' Car Line division of ACF Industries, Inc., New York. He was most recently director of transportation for Stauffer Chemical Co., New York. Shippers' Car Line leases tank cars and other special cars to industry.

OIL

INTEGRATION AND COMPETITION IN THE PETROLEUM INDUSTRY

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This vital new book assesses the impact of the gigantic size and integrated structure of the U.S. petroleum industry on its competitive performance. The most critical conclusions are drawn concerning the present system for regulating the production of crude oil.

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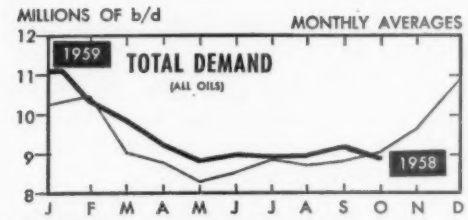
PETROLEUM WEEK'S

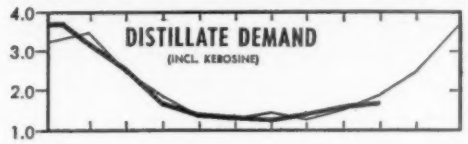
Fingertip Figures



Figures for period ended November 20, except as noted

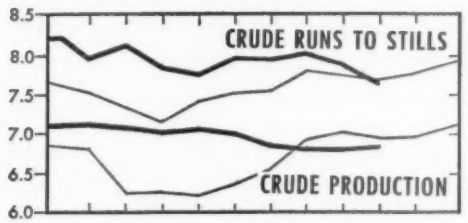
TOTAL DEMAND

Latest 4-week average	9.865
Year ago	9.705



DISTILLATE DEMAND

Latest 4-week average	2.389
Year ago	2.326

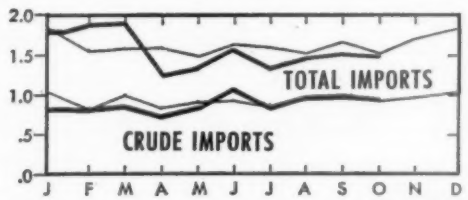


RUNS TO STILLS

Latest week	8.017
Previous week	7.892
Year ago	7.880

CRUDE PRODUCTION

Latest week	6.934
Previous week	6.876
Year ago	6.975

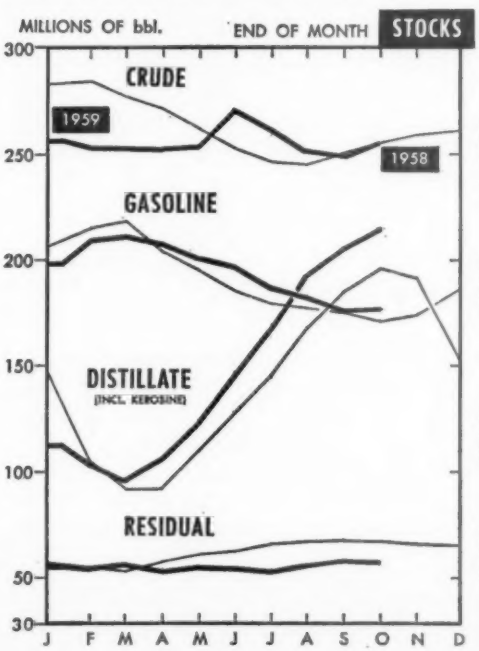


TOTAL IMPORTS

Latest week	1.583
Previous week	1.826
Year ago	1.733

CRUDE IMPORTS

Latest week	.897
Previous week	1.064
Year ago	1.002



CRUDE STOCKS

Week-ended 11-14	253.9
Previous week	254.0
Year ago	254.8

GASOLINE

Latest week	177.3
Previous week	176.4
Year ago	169.3

DISTILLATES

Latest week	206.5
Previous week	211.6
Year ago	196.6

RESIDUAL

Latest week	56.3
Previous week	58.0
Year ago	67.3

Some of the demand "delayed" by the steel strike began to return last week, with total demand bounding up to 10.5-million b/d, the highest for a single week since late last January.

This represents an increase of 700,000 b/d over the previous week and 1.1-million b/d over the first week of November, before steel operations resumed.

Compared to the previous week, the biggest gain in demand was for residual fuel oil (up over 300,000 b/d), reflecting the rising industrial production.

Demand for distillate, including diesel fuel and light burning oils, was up by nearly 300,000 b/d. And gasoline demand showed a 100,000 b/d rise.

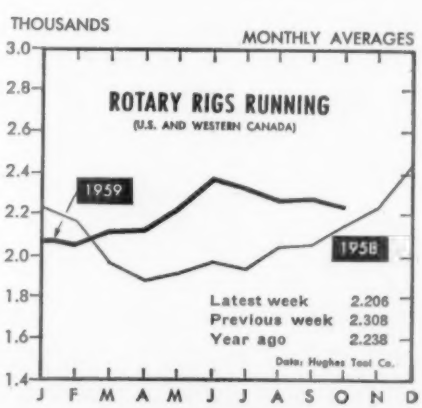
With rising demand, refinery runs are steadily moving higher, topping 8-million b/d last week for the first time since mid-September.

Runs normally move higher at this time of year in keeping with seasonal rises in demand. But during most of 1959, runs have been excessive, boosting product inventories to unnecessarily high levels.

If the industry wants to restore a balance between inventories and demand, now is the time to make the corrections by holding the line on runs.

Crude inventories have been corrected through a long period of tight allowables and by the high refining rates that have converted crude to products.

But the industry continues to show little desire to take the needed step to complete the correction of the top-heavy product stocks. If runs continue to increase—which is most likely, according to economists—then the resulting surplus production of gasoline will plague the industry throughout 1960.



The Market Trend

East and Gulf Areas Ripe for No. 2 Hike

If East Coast heating oil prices take an increase, can the Gulf be far behind? It's a tricky question of follow the leader. It's too early in the season for Gulf Coast prices to force a rise in the East. If the Gulf is to go up, the East Coast will have to lead the way.

The New York delivered cargo price has been 8.5¢ (less 1%) for a long time. The Gulf has been 8.125¢, f.o.b., since Sept. 18. Rates for spot tanker voyages from the Gulf to North of Hatteras have risen to about 0.75¢ a gal.

As long as the 8.5¢ New York price was in force, it was competitive with contract sales at the Gulf in the 7.75¢-7.875¢ range. No refiner at the Gulf, however, has offered spot at 7.75¢ for weeks. On the other hand, no refiner has been able to get 8.125¢. There hasn't been enough winter.

An increase in the 8.5¢ New York price won't be much good unless Gulf refiners up their sights also. If the Gulf failed to move against, say, a 9¢ New York cargo, it would mean that spot No. 2 would be leaking in at 8.875¢. That would be very troublesome early in the winter.

The catch is that it's still early enough that you can find No. 2 to spare at the Gulf. Too, it's very difficult for a refiner to sell spot these days higher than contract. So, the chances are good that discounts of 0.25¢ could be found on three or four cargoes. Last week one cargo without a home was sold "on the water" going north to the East Coast.

And the New York price has been rickety, too; some cargo resellers have been selling spot barges at "a mill over cargo." Before the cold weather hit, this wasn't too friendly to the barge prices, which were posted at 9.6¢, less 0.5¢ summer discount, and less 0.25¢ "special" discount. Term delivered cargo contracts, too, have been offered at "0.375¢ off."

Of course, cold weather shores up a lot of leaky dikes when it comes to No. 2 fuel. Sales to peddlers (who have no storage) react instantly when the chill arrives. This year, especially, East Coast suppliers have been waiting for the cold to hit. For No. 2 prices are low historically.

Call it psychological, if you will, but the odds seem to say that the East Coast will get a good increase in No. 2 and kerosine prices. And the chances seem fair that the Gulf Coast, after a suitable delay, will follow.

No. 6 Fuel Oil At New York:

Spot cargo prices for No. 6 fuel delivered to New York are creeping up. Two weeks ago, sales were closed at $2.20 (which compared with contract cargo of $2.10).

Last week a trader quoted $2.25 for December delivered cargoes to New York. This week a cargo of West Coast oil was offered into New York, January arrival, at $2.33.

Pale & Red Oils:

It's a big deal when South Texas neutral oils come in for a price change. This week quite a few of the suppliers were advancing their quotes by 1¢ a gal.

The last previous change in pale and red oils was a 1¢ increase on Feb. 18, 1958.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of November 23

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Gasoline, 98 oct prem 12.25-13
- Gasoline, 92 oct reg 11-11.5
- Kerosine 8.625-10.375
- Heating oil, No. 2 ..... 8.125-9.875
- Gas oil, 48-52 d.i. 8.375-10.125
- Fuel oil, bunker "C" $2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 14.75
- Gasoline, 93 oct research prem 11.25
- Gasoline, 87 oct research reg 10.375
- Gasoline, 79 oct research 9.625
- Gasoline, 70-72 oct motor method 9.5
- Kerosine 8.625-8.875
- Heating oil, No. 2 ..... 8.125
- Gas oil, 48-52, d.i. 8.375
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- Kerosine 9.35-9.6
- Heating oil, No. 2 ..... 8.85-9.1
- Fuel oil, No. 6 ..... $2.37-2.47

Okla-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg 10.5-11.5
- **Kerosine ..... 10-10.125†**
- **Heating oil, No. 2 ..... 9†**
- **Fuel oil, No. 6 ..... $1.60†-1.80**

Chicago, bulk
- Gasoline, 91 oct reg 11.5-11.75
- **Heating oil, No. 2 ..... 9.375†-10.85**
- Fuel oil, No. 6 high sulfur 7.4-7.5

Los Angeles, rack
- Gasoline, 88 oct reg 12.15-12.65
- Diesel fuel, PS 200 ..... 7.75-11.25
- Light fuel, PS 300 ..... $2.80
- Heavy fuel, PS 400 ..... $2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- Propane, Oklahoma (Group 3) 5
- Propane, Baton Rouge 5.625-5.875

Pennsylvania Lubes
- Bright stock, 25 p.t. 23
- 200 vis. neutral, 25 p.t. 25

Mid-Continent Lubes, Tulsa basis
- **Bright stock, solvent, 95 v.i. ..... 25†-26†**
- **Neutral, solvent, 200-210 vis. ..... 21.5†-22.5†**

Gulf Coast Lubes
- **Bright stock, solvent, 95 v.i. ..... 24-25†**
- **Neutral, solvent, 200 vis. ..... 20.5-21.5†**

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130 ..... 16.5
- Gasoline, 79 oct research 10
- Kerosine 10.125
- Gas oil. 48 d.i. minimum 9.625

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9 ..... $2.62-2.97
- North Dakota, 36.0-36.9 ..... 2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ..... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N. M., inter., 36.0-36.9 ..... 2.93
  - West Texas, N. M., sour, 32.0-32.9 ..... 2.71
  - East Texas, flat 3.05-3.25
  - Mirando, 28.0-28.9 ..... 3.31
- Illinois Basin, flat 3.00
- Pennsylvania Grade, Bradford dist., flat 4.40
- California, Signal Hill, 21.0-21.9 ..... 2.22-2.32†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.77-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ..... 2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.) $2.38
- Leduc-Woodbend (Alta.) 2.53
- Redwater (Alta.) 2.42
- Steelman A (Sask.) 2.435
- Virden (Man.) 2.31

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 47.0-47.9, Tucupido $3.34
- San Joaquin, 41.0-41.9, Puerto la Cruz 3.10
- Oficina, 35.0-35.9, Puerto la Cruz 2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay 2.30
- Bachaquero, flat, Las Piedras 1.73-1.88
- Tarra, 38.0-38.9, San Lorenzo 2.83
- Lagunillas Heavy, flat, Cardon 2.10

†*Differential per deg. of grav. varies.*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.90
- Safaniya, 27.0-27.9, Ras Tanura 1.50
- Iran, 34.0-34.9, Bandar Mashur 1.86
- Iran, 34.0-34.9, Abadan 1.81
- Iraq, 35.0-35.9, Fao 1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.67
- Qatar, 41.0-41.9, Umm Said 2.05
- Neutral Zone, Burgham, 23.5-24.4, Mina Saud 1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud 1.38

Middle East, Eastern Mediterranean
- Arabian, 34.0-34.9, Sidon $2.27
- Iraqi, 36.0-36.9, Tripoli, Banias 2.31

Far East, Cargoes FOB Lutong, Sarawak
- Seria Light, flat $2.57

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean (USMC—17½%) $2.35†
U.S. Gulf-New York, dirty (USMC—27½%) $2.07
NWI-USNH, dirty ..... (USMC—45%) $1.51
NWI-UK/Cont., dirty ..... (Scale—45%) 17/10*
PersianGulf-UK/Cont.dirty (Scale—48¾%) 24/11*
Persian Gulf-USNH, dirty ..... (USMC—67½%) $4.13

**Sterling.*

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DEPT/Personals

REMICK McDOWELL has been elected president of Peoples Gas Light & Coke Co., Chicago, succeeding **Joseph J. Hedrick**, who will retire in January. McDowell was executive vice-president. **Robert M. Drevs**, formerly secretary, was elected vice-president. The position of executive vice-president will not be filled.

H. J. Peckheiser

R. McDowell

HARRY J. PECKHEISER has been appointed resale marketing manager for Mobil Oil Co., domestic operating division of Socony Mobil Oil Co. Peckheiser was formerly vice-president and director of marketing for General Petroleum Corp. Mobil Oil's sales department is being modified to handle the increased workload anticipated by the recent merger of Magnolia Petroleum Co. with Mobil Oil, and the impending merger of General Petroleum with Mobil on Jan. 1. **Harry A. Bade**, formerly general manager of the New York City division, is the new general manager of the West Coast division, and **Harold E. Jenkins**, formerly Mobil's resale sales manager, succeeds Bade as general manager in New York. **Clyde W. Port**, formerly general sales manager for General Petroleum in Los Angeles, becomes general manager of Mobil's Twin Cities division. **Jack A. Simpson**, formerly general manager of General Petroleum's Northwest division, in Portland, Ore., becomes resale sales manager for Mobil's West Coast division. **George A. Klaffky, William E. Greeley**, and **William V. Butler** have been assigned to newly created positions in the sales department. Klaffky, formerly general manager of Mobil's Twin Cities division, is the resale programs manager; Greeley, formerly general manager of the Lakes division, is resale development manager; and Butler, formerly commercial sales manager for the Lakes division, is now manager of fleet sales.

EDMUND DECHERD is the new manager of exploration and producing accounting for Mobil Oil Co., domestic operating division of Socony Mobil Oil Co., in New York. He was formerly assistant comptroller for Magnolia Petroleum Co., Dallas, a Socony affiliate, which recently combined with Mobil Oil.

KENNETH F. HEDDON succeeds **Kenneth W. Cunningham** as assistant manager of Sun Oil Co.'s western sales division, with headquarters in Detroit. Heddon, who joined Sun in 1933, was appointed manager of the industrial products department at the company's Canadian office in 1944, and was named to his most recent post—district sales manager at London, Ont.—in 1958. Cunningham, who has been with Sun since 1921, is now on special assignment.

LOREN L. WARE, vice-president of Sinclair Oil & Gas Co., Tulsa, has been named coordinator for the geological, geophysical, land, scouting, and conservation and proration sections. Ware, with the company since 1944, became general superintendent of exploration at Tulsa in 1957. He was named vice-president of exploration in 1958, and a director this year. **Angus A. Davidson**, general attorney, was given the additional duties of legal coordinator. He will coordinate legal, lease, tax, claims, and Federal Power Commission matters. Davidson, who has held various legal posts with Sinclair companies in Independence, Kan., and New York, became counsel for Sinclair Pipe Line Co. in 1953. He was named general attorney for Sinclair Oil & Gas in 1956.

L. L. Ware

W. H. Bohn

WILLIAM H. BOHN is the new assistant to the president of Hartol Petroleum Corp., with offices in New York. He was previously marketing vice-president of Preferred Utilities Mfg. Corp., manufacturer of heating, power, process, and combustion equipment. In his new position, Bohn will direct Hartol's new expansion program and coordinate the operations of 16 terminals the company now maintains.

VAN A. CUMMINGS is the new assistant manager of LPG sales for Texas Natural Gasoline Corp., Tulsa. He was formerly associated with Cities Service Oil Co., serving as LPG sales manager in the southwest region and later as supervisor of retail sales in the Des Moines (Iowa) area.

JOE A. MOSS, attorney in Cosden Petroleum Corp.'s legal department since 1953, moves up to assistant general counsel. He is also assistant secretary of the company.

F. M. FILES has been promoted to coordinator of manufacturing for Phillips Petroleum Co.'s international department, with offices in Bartlesville, Okla. He will coordinate operations that include gas liquids plants and refineries in British Columbia,

and San Roque, Venezuela. Files, with Phillips since 1930, has been primarily associated with the refining department. He was most recently on loan from that department, serving as technical advisor to the manager of the international department.

I. V. JOLLY has been named LPG sales representative for Bay Petroleum Co., a division of Tennessee Gas Transmission Co., Houston. Jolly joined Tuloma Gas Products Co. as district sales representative, in Houston, in 1954. Before that, he was with Stanolind Oil & Gas Co. in Woodsboro and Pettus, Tex., and Tulsa, Okla.

FREDERICK C. WESTPHAL, JR., becomes manager of Esso Standard Oil Co., Bayonne (N.J.) refinery. He succeeds **David F. Edwards**, who has been invited to join the new Humble Oil & Refining Co. (Del.) as employee relations manager. Westphal, who joined Esso in 1940, was most recently administrative superintendent of Esso's Bayway refinery, in Linden, N. J. He headed the refinery's receiving, packaging, and shipping division, and later its business service department, before he was named superintendent last year.

F. C. Westphal, Jr. C. F. Baird

C. F. BAIRD has been appointed assistant treasurer of Standard Oil Co. (N.J.), in New York. He joined Jersey Standard as a foreign exchange analyst in 1948, and became senior analyst for the European area in 1952. Baird was transferred to London in 1955 as the company's deputy European financial representative. He returned to New York last year as manager of the foreign exchange division in the treasurer's department.

FRANKLIN G. SPAIN heads all activities in the newly centralized land department of Diversa, Inc., in Dallas. He was formerly in charge of the company's land activities in the New Orleans office. Before joining Diversa earlier this year, Spain was Rocky Mountain district manager of the land department for J. M. Huber Corp.

RICHARD J. PLANK is the new executive vice-president of New York State Natural Gas Corp., Pittsburgh. He will assume the presidency on Feb. 1, when **Fenton H. Finn** retires. Plank was formerly vice-president for operations of Peoples Natural Gas Co., an affiliated company in the Consolidated Natural Gas System.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: "OPPORTUNITIES" :EQUIPMENT :USED OR RESALE

DISPLAYED RATE

The advertising rate is $16.75 per inch for Equipment and Business Opportunity advertising appearing on other than a contract business.

EMPLOYMENT OPPORTUNITIES

The rate is $28.00 per inch. Subject to Agency Commission.

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$1.80 a line. Minimum 3 lines. Box numbers count one additional line.

POSITION WANTED. Undisplayed rate is one half of above rate, payable in advance.

DISCOUNT of 10% if full payment is made in advance of four consecutive insertions of undisplayed ads.

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Send NEW ADS or Inquiries to Classified Advertising Division,
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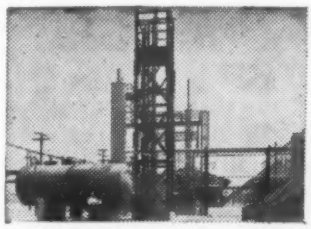
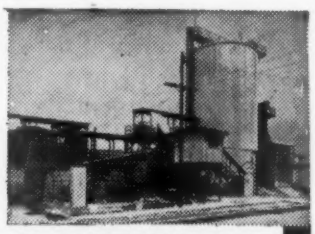




NO LIMIT • NO RESERVE
PIECE BY PIECE

AUCTION

Gigantic 2 Day Sale

TUES. - WED.
Dec. 8th-9th
10:30 a.m. Each Day

on the premises
11th & Irwindale
AZUSA, CALIF.
(18 Mi. E. of Los Angeles)

Over $5,500,000.00 Installation

CHEMICAL MFG. & STORAGE PLANT

formerly operated by American Cyanamid Corp., declared surplus to needs of U. S. Government.

Lead-Lined & Steel Tanks and Towers—Over 250

Many cork insulated, Hi Pressure. Vertical & Horizontal, 10 lb to 20 lb. lead, ⅜ to 1½" Steel Plate to 40 ft. long.

Refrigeration Equipment

(4) Frick & Vilter Ammonia Compressors to 278 Ton. Chill Storage Room w/refrigerator door & auxiliaries.

$350,000.00 Instruments & Meters and Gauges

Taylor, Beckman, Leeds & Northrup and other top names: Gages, Ph indicators, Temp. Recorders, Panels, Taylor Binoc Thermometers, etc.

Distillation and Drying Equpt:

(12) Hooker Evaporators w/circulating pumps and motors and measuring instruments. (2) Pittsburg Lockfodrier Air Driers; (2) Bowser Vacuum Stills and Filters

Hammermill & Screens Conveyors & Elevators

Apron Pan Conveyors, Screw Conveyors, Container Washing Line System, Bucket Elevators, Car Spotters, Discharge Screen Conveyors, Conveyometer Auto. Weighing Feeder.

Miscellaneous Equipment

(12) I-R Type 30, Worthington and Gardner Denver Compressors. (40) Blowers. 100's of Centrifugal and Deep Well Pumps, Porcelain Valves, Brine Tower.

Complete 1670 ft. Monorail System. Scores of Hoists to 2 ton capacity. Fire Alarm and Fire Fighting System w/fire hydrants, 2½" water hose, etc. Diesel and Gas Powered AC Generating Sets to 50 KW.

Complete Fume Disposal Plant

Paint Spray Booths, Agitators and Thickeners, 100 Space Heaters, steam and gas fired.

ALSO: 50 buildings to be moved, mainly bolted timber with transite roofs; Electrical & Utility Installations, 5200 ft. Railroad Spur, 2,000 KVA Oil and Dry Transformers from 3 KVA to 500 KVA.

Hundreds of Explosion Proof Motors; Power Paneling, Copper Wiring, Conduit, Steam and Pipe Lines, Water Lines, Forklift.

Send for Free Circular

MAX ROUSE and Sons, Auctioneers
Serving Business and Industry Since 1920
361 S. Robertson, Beverly Hills, Cal. OL. 5-9300

Poor Aladdin . . .

The best service at Aladdin's command was rubbing a lamp and WISHING for what he wanted. YOU have "Searchlight" to help you find what you want!

"CAN SEARCHLIGHT" SERVE YOU?

A Poor Way to Handle Things

ETHICS ARE ETHICS, no matter which way you look at them. So it seems to us that the Federal Trade Commission's press department went overboard last week in reporting the "coercion" findings of an examiner against Texaco, Atlantic, and Shell.

In the first place, FTC's news release completely ignored the most significant finding of all—that the contracts that existed between the companies and their dealers were neither unreasonable nor oppressive; that, in effect, they were fair, legal, and valid.

It made no mention, either, of another finding that the degree of the oil companies' control over their dealers was insufficient to force them to buy and display only sponsored tires, batteries, accessories, and supplies.

It also failed to note that there was nothing in the contracts between the oil companies and the TBA manufacturers that required dealers to buy only their products.

To our way of thinking, these are serious omissions.

THE NEWS RELEASE made a great to-do about one of the ten points. This was the ruling that the oil firms had "unlawfully coerced" their dealers to buy sponsored TBA items. That was bad enough, but the release implied in the same breath that the oil companies did this "in return for commissions" from the manufacturers.

That was not the case at all, for the findings stated that the commissions to the oil companies were based upon "substantial services rendered" in the promotion of the various products. The release did acknowledge this subsequently, in a lefthanded sort of way. But the initial handling left much to be desired.

IT SEEMS TO US, too, that the examiner's findings on the coercion counts are pretty thin. They were hitched to the testimony of 35 former Texaco, Atlantic, and Shell dealers who were called in by FTC's examiner. In opposition to them, however, the oil companies produced 220 dealers and ex-dealers who testified that they handled nonsponsored TBA items without objection or complaint.

That's a ratio of slightly better than six to one. In matters of law and order, such a preponderance of testimony in behalf of the companies and their policies ought to be enough to make even a preliminary conclusion in favor of the negative side highly questionable.

It is our understanding that the three companies were puzzled and chagrined by the way this matter was handled. Based on the facts at hand, they had every right to be.

Announcing the NEW

BJ Centrilift

Submersible Motor Centrifugal Pump

Pumps very large volumes of fluid at lowest cost per barrel!

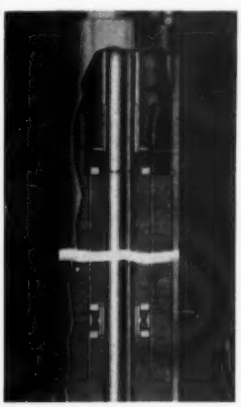
Byron Jackson announces the BJ Centrilift—a new sub-surface oil well pump designed for economy and dependability over a wide range of industry needs. These include water supply wells in flood projects... production wells in natural water drive or in artificial floods with low oil/water ratio... deep wells... fresh water or chemical brine wells... crooked or whip-stocked wells... and special applications for severe corrosive or abrasive conditions.

The BJ Centrilift combines the extra capacity of centrifugal pump design with the rugged economy of a close-coupled BJ Submersible motor drive. Submerged in well fluid and suspended on standard tubing, the BJ Centrilift offers the highest operating efficiencies with the lowest horsepower requirements... the lowest lifting cost per barrel of fluid. Fast, dependable field service is available through BJ Tools' network of plants, warehouses and field service centers.

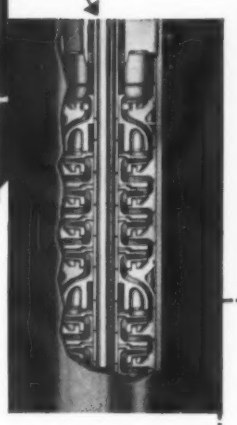
A product of more than 87 years of centrifugal pump leadership

Byron Jackson has been a leading pump manufacturer since 1872... pioneering in centrifugal pumps, including both deepwell turbine and submersible motor types. From this 87-year background of experience and leadership comes the great new BJ Centrilift—designed to serve a growing need for superior sub-surface pumps for the oil industry.

SEAL SECTION. BJ Centrilift utilizes multiple mechanical seals, combined with simple pressure equalizing system for positive sealing reliability.



MOTOR. Byron Jackson-built motor is of the squirrel cage induction type... oil-filled to prevent internal corrosion and provide long, maintenance-free operation.



PUMP. Capacities of 500 to 17,000 BPD, in as many stages as required for operating head. Diameters to fit well casing sizes of 5½", 7", 8⅝". Bowls, impellers and shafting of corrosion-resistant materials for long life, low maintenance.

MAIL THIS COUPON FOR ADDITIONAL INFORMATION

Please send price and performance data on BJ CENTRILIFT equipment for the following application:

WELL NAME _____ WELL NUMBER _____

WELL LOCATION: FIELD _____ COUNTY _____ STATE _____

DEPTH _____ CASING SIZE _____

PRESENT PRODUCTION, BPD _____

DESIRED PRODUCTION _____ ESTIMATED LIFT _____

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

Byron Jackson Tools, Inc.

Oil Well Pump Section

A Subsidiary of Borg-Warner Corporation

P.O. Box 3098, Tulsa, Oklahoma • Telephone: WEbster 2-3242

How steel tubing saves weight in helicopter...in budget, too

Shown below is the main rotor shaft of a new model helicopter. Because it was hollowed out of solid steel bars to save weight, it was costly to make. After machining to thousandths of an inch accuracy, previously undetected steel flaws showed up. One out of every five parts had to be rejected.

Timken Company Metallurgists were consulted. After careful study, they recommended a special analysis of Timken® seamless steel tubing. Savings began immediately. Because the hole was already there, no drilling was required. Steel was saved. And with the extra advantage of uniform forged quality in Timken seamless tubing, rejects of finished parts were practically nil.

Let us help you cut your costs, get better quality finished products. Our engineers will recommend the most economical tube size for your hollow parts jobs, one guaranteed to clean up to your finish dimensions. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

WHEN YOU BUY TIMKEN STEEL YOU GET:

1. Quality that's uniform from heat to heat, bar to bar, order to order
2. Personal attention from the experts in specialty steels
3. Over 40 years experience in solving tough steel problems

TIMKEN ALLOY STEEL AND SEAMLESS STEEL TUBING ARE AVAILABLE FROM WAREHOUSE STOCKS IN 44 CITIES IN THE UNITED STATES